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METHODS OF ACCOUNTING IN THE COLLECTION OF CITY WASTE

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The collection of garbage, ashes, rubbish and other forms of city waste is as much of a business as is the selling of dry goods or diamonds and should be done with as close attention to business detail. Whether the collection is done by private contract or by the municipality itself, it should be conducted upon business lines and not as a charity. The tendency with municipally controlled activities is to use them to make places for the lame, the halt and the blind. The collection of garbage is a business and not a charity.

No standardization of municipal accounting in the collection of city waste has been brought forth. Even the statistics of the United States Labor Department are bewildering and furnish no basis for comparisons. Some system of accounting should be devised that would commend itself on account of its simplicity and accuracy.

The kind of garbage, whether wet or dry, wrapped or unwrapped, mixed or unmixed with rubbish or taken as free from rubbish as possible, whether mixed with ashes or any other substances should be clearly shown. The composition of household waste is practically the same in all American cities, any variation from the average occurring in the differ-

ent sections of the same city. The character of garbage in the can varies with the system of disposal and the household rules for primary separation. There may be a "one-barrel," "two-barrel" or "three-barrel" primary separation by the householder.

Certain rules should be made defining clearly the method of separation desired. These rules should as nearly as possible meet the requirements of the particular method of disposal of the city in question, not losing sight of the necessity and desirability of sanitary procedure at every step from collection to final disposal. These rules should be printed in various languages and widely distributed, preferably, through the medium of the collector. They should be printed on a light card so that they may be hung in the kitchen, always in plain sight for the instruction and guidance of the householder.

Growing out of the question of primary separation, arises another question of whether a separate set of collectors and teams should be employed for collecting each distinctive kind of refuse. This again is governed very largely by the method of disposal. Where the reduction system is employed, garbage alone, and as free as possible from rubbish must be taken to the disposal plant. The balance of the waste, that is, rubbish and ashes, must be collected in various ways. In some cities the rubbish is mixed with ashes and dumped; in others the rubbish is incinerated and ashes handled separately. In cities employing incineration for the destruction of their garbage, it is more convenient to have the householder put the combustible rubbish with the garbage, the ashes being handled separately.

Another factor comes into the system of accounting, namely, whether or not a city is districted into certain definite districts, and the same team handles the various kinds of refuse from that district; or whether the garbage of the whole city is collected by one set of teams, the rubbish by another, and the ashes by still another. As may well be seen, all these different methods require or should require separate forms of accounting, which should be made to show as nearly as possible the cost of collecting each kind of refuse in order to make a basis for fair and equitable comparison.

With the refuse upon the wagon, there enters into the accounting the question as to whether or no the conveyance in its entirety is the property of the city or contractor, or whether a portion of it is furnished by the driver and the balance by the city or contractor; and as to whether or no the team is owned by the city or contractor, or by the collector. These items should all be carefully stated for the purpose of comparison.

The length of the haul, as nearly as it can be figured in averages, with a statement of the square miles of territory to be covered, should be given. Then again, it makes a difference whether the whole of the haul is directly

to the disposal plant, or to a transfer station or stations, the balance of the haul being made by some other conveyance, railroad or otherwise. The haul by team should state as nearly as possible the average mileage traveled. The length of the haul by rail should be stated specifically, the cost per car for the service, whether the city or contractor is responsible for the upkeep of the cars, and whether the city or the contractor furnishes the ground and equipment at the transfer station for handling the refuse. Careful statement should be made as to the number of men and teams employed, and the hauling capacity in cubic feet of the wagons or carts used.

Careful mention should also be made of the men employed in the office of accounting and supervision as, for instance, the superintendent and assistants, telephone operators, engineers for handling hoists and, in fact, all whose wages are properly charged to the collection of waste.

In the accounting between the collection department and the citizen, a great deal may be done in keeping systematic record of all complaints, and a definite check be kept upon the activities of each individual collector. The number of places receiving the service of collecting the various forms of refuse may be recorded and indexed by the use of vari-colored cards. A convenient card is one made to represent a city block. The dividing line between districts should come in the middle of the street and each district comprise a certain number of city blocks. These cards, each representing a city block, should be arranged by the clerk in charge of complaints, in the order in which the garbage or refuse is to be collected by the driver. The drivers should be instructed to make collections in this order, and to collect a block entire before passing to the next one. At the close of a day's work, the driver reports where his collection for the day ended, and it may be indicated by a guide card showing the day of the week. An absolute check on the collector's work is thereby made possible. It accomplishes another thing; that is, it makes it easy to locate the collector at any time, by simply noting the block upon which he is to begin work on a respective morning. This reduces the business of collection to a system, instead of the haphazard way of turning a man loose in a certain territory and telling him to return with the "stuff." As each collector returns to the disposal plant or transfer station. the character of the load, the number of the wagon or box should be recorded. This clearly identifies the load and the man who delivered it, and serves as a means of checking up complaints or inquiries that may come in during the day.

Complaints so received should all be recorded upon a loose-leaf ledger, and a slip handed to the driver of the particular district from which the complaint comes. As an offset to the citizen's complaint ledger, should be leaves adjoining in the ledger, giving the report of the driver upon each complaint — no cause, bad condition of cans, or other reason

for refusing collection. This dual loose-leaf ledger system operates in minimizing complaints. As a general average, over 90% of the complaints received are due to faults of the householder and a careful driver through his reports to the complaint clerk, often anticipates the complaint. The complaint clerk, by referring to the ledger, can explain to the citizen at once why he is not receiving service.

A careful record should be kept showing the daily, weekly and monthly record of each collector's work, so that changes can be made in equalizing the work of the various collectors. This record should take into account the number of loads collected, miles traveled, and complaints recorded in each district. This can all be easily done, without much labor or cost, by the use of specially ruled books.

Nothing has been said thus far as to the weights of the various kinds of refuse, for the reason that the question is too frequently a mere estimate. Waring's tables giving in pounds the average annual per capita amounts of the different kinds of refuse collected in various cities are still standard. Some cities weigh their garbage; I doubt if any weigh all of it. Some weigh a certain number of loads in the summer season and in the winter season, and make their estimates from the average of these weights. The accounting by cubic feet or yards is also unsatisfactory because it cannot take into consideration the difference between small and large loads, or the fact that one driver will "tramp" his load, while another, to save his team, is careful not to. If weights are to be relied upon, every load should be weighed. Fortunately, we have a method of accounting which is more accurate for purposes of comparison, when all the conditions of collection are taken into consideration, and that is, the per capita cost per year, based upon the census population, taking into account all of the various forms of refuse that are handled. Estimates of weights may be made in this connection, simply to show that the average amount per capita per year of each kind of refuse is being collected.

These suggestions are offered as at least an attempt to reduce the methods of accounting in the business of collecting city waste to some system.

A STANDARD FORM FOR STATISTICS OF MUNICIPAL REFUSE

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The realization of the value of proper municipal sanitation is growing rapidly in this country. With the increasing congestion in cities, the conduct of public departments is becoming more difficult. By dint of hard scientific work, available methods for securing a proper measure of sanitation have been kept abreast of the conditions, one important factor in this progress is experience. Experiences, however, are useful to others chiefly according to the care and regularity with which they are recorded; and experiences derived from several sources, are more useful, if they are recorded with some degree of uniformity.

In many cases, the interpretation and use of experience can be made properly only by experts. This is true because, in many branches of Sanitary Engineering, the same methods are not applicable everywhere and the experiences of one city must be applied with care and understanding, to relieve conditions in another city. Most branches of city sanitary work call for more expert application in their routine operation, than does the collection and disposal of refuse. This requires a high degree of organizing and managing ability. The management may differ—the methods used not. One who has investigated refuse disposal work abroad, cannot but be impressed with the uniformity of methods used there, more especially for the house treatment and collection of refuse, but also for the disposal. German cities are approaching a common standard in this work. Differences in the effectiveness of the service are in large part due to differences in the ability of the department chiefs in charge of the work.

The obvious suggestion born by these considerations is that an intelligent familiarity with methods employed in different cities and with the results accomplished thereby, will be of great use in widening the vision, of the department chief, in bringing good and bad methods to his attention and in this gradually bringing the better methods into more common use. In no better way can this be accomplished, than by a wide-spread use by city officers of a standard form for statistics of municipal refuse.

It is on this account that the attached standard forms have been prepared and presented to the American Public Health Association. The forms are divided to cover the different parts of refuse disposal work. After provision for a few general facts describing the city for which the statistics are prepared, there follow four sections, dealing respectively with Refuse Materials, House Treatment, Collection and Disposal of

Refuse. These sections are subdivided to bring out the details of the work. In preparing the forms, two functions were considered: (1) its usefulness to other cities and (2) its usefulness to the department keeping the records. In order to be valuable, the form must fulfill these two functions.

It is hoped that a committee of the Association will be appointed to undertake a final revision of the forms and an annual compilation of the resulting facts.

STANDARD FORMS FOR STATISTICS OF MUNICIPAL REFUSE

(The forms herewith reproduced were presented at the annual meeting of the American Public Health Association, Havana, Cuba, December, 1911.)

.....Ending.....19

(1) Name of City.....

(2) Population.....Year.....

(3) Character of Population	Distribution by		
	Property	*Area*	*Population*
Per cent Residential			
Per cent Business			
Per cent Manufacturing			
Per cent Foreign			

A. Statistics of Refuse.

(4) Average daily quantity of refuse:

	Summer		*Winter*		*Average*	
	Yards	*Tons*	*Yards*	*Tons*	*Yards*	*Tons*
Garage						
Ashes						
Rubbish						
Total Refuse						

(5) Weight per cubic yard:

	Minimum	*Maximum*	*Average.*
Garbage			
Ashes			
Rubbish			
Total Refuse			

(6) Quantities of Refuse:

	Pounds per Capita per year.	*Pounds per 1000 Population per day.*
Garbage		
Ashes		
Rubbish		
Total Refuse		

(7) Mechanical Analyses:

	Glass	*Bones*	*Paper*	*Rags*	*Metals*	*Wood*	*Dust*
Garbage							
Ashes							
Rubbish							
Total Refuse							

(8) Chemical Analyses:

	Carbon	*Water*	*Ash*	*Volatile Matter*	*Grease*	*Tankage*	*Ammonia*	*Potash*
Garbage								
Ashes								
Rubbish								
Total Refuse								

B. Statistics of House Treatment

(9) Size of House Can.....
(10) Type of House Can.....
(11) Number of Cans.....
(12) Location of Can.....
(13) Is Can set out for collector?.....
(14) Number of separations.....
(15) Is the garbage drained or wrapped in paper?.....

C. Statistics of Collection.

(16) Is collection done by city or by contract?.....
(17) Does the city own the stables and equipment?.....
(18) Number of collections per week.....

	Summer			*Winter*		
	Business	*Residential*	*Outlying*	*Business*	*Residential*	*Outlying*
Garbage.....						
Ashes.....						
.....						
.....						
Total Refuse.....						

(19) Average length of haul:—(Grades)
Garbage
Ashes
Rubbish
(20) Type of Collection Wagons used:

	Garbage	*Ashes*	*Rubbish*
Capacity (cu. yds.).....			
Material.....			
No. of horses.....			
Attendants per wagon.....			
How dumped?.....			
Covered?.....			
Maker.....			
Cost.....			

(21) Frequency of washing wagons:
Method of washing wagons:
(22) Equipment required:

	Summer			*Winter*		
	Garbage	*Ashes*	*Rubbish*	*Garbage*	*Ashes*	*Rubbish*
No. of wagons						
No. of men						

(23) Cost of collection per ton:— Garbage Ashes Rubbish

D. Statistics of Disposal

(24) Method of disposal—Garbage
Ashes
Rubbish

Sanitary Aspects.

(25) Disposal by dumping:
Classes of refuse dumped
Number of dumps
Area of available dumping grounds
How are dumps kept up?
Cost of disposal per ton

(26) Disposal by burial:
Location
Character of soil
Area required per ton per year (sq. feet)
Frequency of using soil
Number of men employed
Cost per ton.

(27) Disposal by feeding to pigs:
Is the disposal by the city or by contract?
Annual payment to contractor
Location of piggery
Number of pigs kept—Summer
Winter
Number of pigs lost per year
Are the pigs vaccinated?
Is the garbage sterilized before feeding to pigs?
Number of men employed at the piggery
Gross cost of operation per ton of garbage
Revenue per ton of garbage

(28) Disposal by reduction:
Location of reduction plant
Type of plant
Quantity of garbage reduced per year, tons
Number of men employed at the plant—Summer
Winter
Cost of plant
Gross cost of operation per ton
Quantity and value of by-products
Revenue per ton

(29) Disposal by incineration (including rubbish sorting)
Capacity of each plant..... Number of plants.....
Classes of refuse burned
Location of plant
Type of plant
Coal used per ton of material burned
Total number of men employed at the plant—Summer
Winter
Gross cost per ton
Revenue per ton
Cost of plant
Value of power developed
Clinker utilization

E. Miscellaneous Statistics.

(30) Under what city department is the work done?
(31) How is manure kept at stables?
How is manure removed? ..... How disposed .....
(32) Are there loading stations in the city?
If so, how many and for what classes of refuse?

THE DEVELOPMENT OF A MUNICIPAL LABORATORY

GEORGE E. BOLLING,
Brockton, Mass.

Read before the Massachusetts Association of Boards of Health, April 25, 1912.

A paper read before the Mass. Association of Boards of Health nearly five years ago by Dr. E. C. Stowell entitled "The Possibilities of a Clinical Laboratory in a Country Town in Relation to Public Health Work" told interestingly both of the good work accomplished and the difficulties to be overcome by a pioneer in that field in a community without gas or public water supply; and more recently, in January 1911, Mr. C. K. Blanchard, agent of the Wellesley Board of Health, in a paper on "Modern Board of Health Methods in a Small Town" discussed a similar establishment in Wellesley, the latter, however, being on a considerably more pretentious scale.

It is the purpose of this paper to draw attention to some of the possibilities existing in small cities in clinical and public heath laboratory work and also in various lines of municipal laboratory work the latter being applicable as well to cities that could not properly be classed as small.

Sixteen years ago the writer was appointed assistant in the laboratory of the Sewerage Department of Brockton, which was devoted entirely to the analysis of sewage and effluent for the purpose of the most efficacious operation of the sewage-filtration plant of that city, the policy of the heads of the department being to maintain the laboratory merely for daily operation and record rather than for any research, in fact, during 1½ years of service but one piece of experimental work of some two months' duration was permitted.

Succeeding within two years to the charge of the laboratory, with the duties about evenly divided between chemical and clerical, and being by nature, fortunately or otherwise, of an inquiring turn of mind, the daily grind of routine analyses and record keeping palled upon us, as the editorial writers say, and created a longing for work of a live character.

The physicians of the city having made it evident that they wished quicker reports on contagious diseases than were available from the state board of health by petitioning the local board to establish a laboratory for such purposes, in 1902 the Sewerage Department heads gave their consent for the writer to undertake the diagnostic bacteriological work of the local board of health provided it would not interfere with the regular work of the laboratory. The board of health furnished the funds for the purchase

of a microscope, incubator and such other apparatus as was necessary and early in 1902 the first examinations were made.

The laboratory being situated at the filtration plant, some four miles from the centre of the city, and funds not being available for a messenger it was necessary to make arrangements with the officials of the electric car line between Brockton and Taunton, that passed within a few hundred yards of the plant, to receive the specimens which were sent out daily, at a certain hour from the board of health office and put aboard the car at the centre, and to deliver them to the laboratorian waiting at the point nearest the plant. This, as may be inferred, occasioned considerable bother and lost time waiting for cars that when coping with the snows of winter maintained a very uncertain schedule, to speak as kindly as possible of a cross-country electric car line. However, to give the system its due credit, of the many hundreds of shipments made during the period of over seven years it was kept up, not a single specimen went astray.

At the outset the board of health decided to make free of charge the following examinations: diphtheria, tuberculosis, typhoid fever, malaria, the examination of sputum for pneumococci and influenza bacilli, for gonorrhoea when the patient could not afford to pay and also the sanitary analysis of well water when it was thought that sickness might have been occasioned by its use.

At the end of the first year it was found that some 398 examinations had been made, of which 62% were for diphtheria, and 30% were for tuberculosis diagnosis. That the work has been constantly on the increase is evident from the total of 4183 examinations made ten years later in 1911, an increase of 951% on the first year's work.

The outfits adopted for use in Brockton were modeled mostly after those developed by the laboratory of the Boston Health Department, which had made its start some four years earlier, and were found to give satisfactory service. During the first year's work there also developed a demand for the testing out of some of the numerous disinfectants that the board of health was being besieged to purchase, and occasionally a sample of wall-paper was submitted to be tested for arsenic which was done for the applicant free of charge.

The board of health early decided that the demands for anaylsis of urine could not be undertaken upon a free basis as it was obvious that a laboratory maintained at the public expense for investigations relative to transmissible diseases, hence of interest to the entire community, would be going out of its province to cater to requests that interested single individuals only, such as the possible presence of albumen or sugar in the urine; the bacteriological examinations of urine, however, for presence of tubercle bacilli were deemed properly to enter upon the free list.

From the very beginning, some difficulty was experienced in getting rid

of individuals who demanded free analyses of patent medicines and the like, in order to obtain the formula that they might either put it up for home use or enter it for sale in the regular market.

As the reputation of the laboratory grew, such requests became correspondingly more numerous, and some of the demands made for work of this character were, to a man who was painfully aware of his own limitations, rather staggering. One case the writer recalls being of an individual who stated that he had been told by Alderman So-and So to say that he had sent him and to make the little analysis he wanted. The party went on to say that one of his relatives, sometime deceased, had been a physician and was wont to use a remedy of his own compounding for certain ailments, the formula of which was lost. The party had about ½ oz. of the compound, however, and stated it was known to contain ginger, rhubarb, gentian and peppermint and they were in doubt of 6 or 7 other things, but those could be located by an analysis, capsicum, opium, and valerian, he thought some of them were, any way he would be back by closing time that afternoon for the formula. Needless to say he is still waiting.

Before long another species of individual became in evidence, namely, the unfortunate afflicted with that form of dementia whereby he or she is convinced that somebody is trying to poison them, almost always by surreptitiously incorporating said poison with their food. The writer finds by reference to his records no less than fourteen such cases in the last twelve years and in only one of which was there anything wrong except with the mind of the complainant.

One case recalled at this time had its amusing features: A thin little man bearing a large suit-case came hurriedly into the laboratory one day and drawing the writer to a corner confided that his wife had grown weary of him and was now endeavoring to eliminate him from her society by slowly poisoning him to death. Asked how he knew this he explained that the food he ate at home always distressed him and gave rise to certain definite symptoms while food of a like character partaken of elsewhere proved perfectly harmless. He said that he had talked the matter over with a drug clerk in his town and with him had looked the matter up in the latter's books and learned therefrom that he had all the symptoms of aconite poisoning, and so would the writer please analyze the various articles of food he had brought in his suit-case as he felt certain they all contained much aconite. He had brought cold meat, the various vegetables of a boiled dinner, some cold tea, part of a pie and even some sugar from the sugar bowl, all of which he would leave as he must hurry home to supper. Asked if he didn't fear eating at his home when he was convinced of his wife's duplicity, he said he did not for while his symptoms had been manifest for some time he always ate heartily so as not to apprise her of his suspicions and would then retire to his room and take an antidote. Asked if

he had any objection to telling what his antidote for aconite-poisoning was he said he had not, it was a Cascaret.

Disregarding reminisence, and returning to the progress of the laboratory, we find it being conducted for the next four years, jointly by the Sewer Dept. for its routine work and the Health Dept. for diagnostic bacteriological work.

In 1906, however, the health board decided to take up the sanitary inspection of milk and appointed the writer its agent for that purpose and also for the first time provided an assistant who beside his general laboratory duties also acted as collector of milk samples.

In the same year, also, the local Water Dept. decided that it might be wise to insure the purity of its supply by frequent analyses o fthe inlets of the lake from which the water was taken, and made arrangements to have these analsyes—chemical and microscopical—made at this laboratory.

It will be seen that the laboratory was now serving three city departments regularly, health, water and sewerage, and moreover, other departments such as the fire and school, were occasionally making use of the facilities; the Police Dept. also had for some time been bringing such of its problems as could be assisted in their solution by aid of chemistry to the laboratory, the bulk of their work, however, being examinations of seized liquors for alcoholic strength. Regarding this particular branch it may be of interest to relate one incident to show how the various lines could be made to correlate.

A certain "drug store" had for some time been under suspicion of illegal sale of liquor to numerous undesirable citizens who made the vicinity a decided nuisance to the neighbors and as repeated raids by the police failed to secure any evidence in the line of wet goods, they became convinced that the place was selling nothing but straight "drug-store whiskey," so-called. This, as you probably all know, is made while the customer waits by quickly putting together alcohol, water, caramel color, and beading oil, the last named being a compound of oil of sweet almonds, sulphuric acid and ammonia. Trying a new tack the police inspectors raided the place while customers were inside and proceeding directly to the back room succeeded in getting a quantity of what they alleged to be the aforementioned "drug store whiskey". The owner claimed that it was a medicine that was purchased from a distant city and was not intended as a beverage and had not been made on his premises. Chemical analysis indicated its identity with the artificial whiskey described and upon passing a portion through a Sedgwick-Rafter filter the subsequent microscopical examination disclosed the characteristic organisms of the Brockton Water Supply, melosira being present to the amount of many hundreds to the cubic centimeter. The defense retained the ablest criminal lawyer thereabouts and finally at the trial everything hinged on whether the compound was "drug-

store whiskey" made on the premises or really medicine. In testifying, the writer stated that so much city water had been found present, laying apparently unconscious stress upon the words "city water." The counsel for the defense rose to the bait and, as soon as his inning came round, at once demanded how city water was proven to be present when it could as well have been and probably was well water. Then was sprung the result of the microscopical examination with the statement that the compounding had undoubtedly been done at that time as melosira and asterionella were then present in such numbers as found. It was a new one on him and the jury convicted the druggist.

Also the Medical Examiner found the laboratory a ready help in clearing

View of one end of Brockton City Laboratory

up obscurities and used it whenever occasion required, the same being the case with the District-Attorney.

The surrounding towns that wished quicker results than could be obtained by sending their diphtheria cultures to Boston made arrangements with the laboratory to have such work done for them and at present the boards of health of seven such towns are doing this; while the total number of cultures examined for them in a year is not large, never exceeding fifty all told, the gain in time is an immense advantage.

For three of these towns chemical and bacterial examinations of milk are made, this latter work being confined to from one to four separate

collections a year, which while being wholly inadequate to insure a complete inspection, serves, however, to stimulate the interest of these boards in the matter.

In 1908 the Water Department expressed a desire for more definite knowledge regarding the coal it was buying and a calorimeter, a Parr instrument, was installed at the laboratory. The first lot of coal purchased on a specification basis yielded a rebate from the dealer of some $60.00 more than the cost of the apparatus and we haven't had anything since but what has exceeded the specifications.

Our work in sanitary milk inspection had disclosed numerous cases where the statute laws in relation to milk were being regarded disrespectfully by dealers and all efforts to interest the regularly appointed local inspector of milk failed utterly. We found this office occupied by an estimable old gentleman who had held it somewhere between a quarter and a third of a century and who stated that he proposed to continue as he pleased, which was to merely issue the annual license according to the State law, for which service he was accustomed to remuneration from the city to the amount of fifty dollars yearly. As he was irreconcilable to board of health participation in work to the extent of actual inspection and had a peculiarly strong hold upon the political powers of the city, recourse was had to the State legislature in 1909 which was asked to amend the old statutes and place supervision of the milk supply altogether in the charge of local boards of health. Other boards represented by this Association joined the movement with enthusiasm and the desired legislation was secured.

Our milk work, both in enforcement of our sanitary regulations and of the Statute laws, appealed strongly to the public and to the local newspapers, our efforts and findings being given generous space by the latter. A recent review of the articles printed in the two local dailies since the inauguration of the work in 1906 to date shows that 2787 inches of space or 18.5 full pages in all have been accorded to us.

Our experience in the supervision of our local milk supply has shown us that the appearance presented by a dairy or the score it obtained was not a criterion of the cleanliness of its product, and that intelligent personal supervision by the owner of the detailed work in a dairy essential to the production of clean milk went further toward securing such a product than fancy equipment turned over to hired help. Our motto became "The proof of the pudding is in the eating" and when the milk taken from the wagons of the dealers when ready for final delivery to the consumer showed a clean product we did not insist on more or less costly changes at the dairy that regularly marketed such milk.

We became convinced, also, that there was an economic side to the milk question and that it vies with the health aspect in importance, for as runs

the famous receipt for rabbit pie—"first catch your hare"—so someone must first produce the milk, and if it is not made a profitable undertaking for someone, who will produce it and then where does the health question enter in?

Our final conclusion was that the proper way to inspect milk was by the laboratory and if anything was wrong an inspection of the dairy became necessary, and that to rule indiscriminately that each dairy must be equipped thusly and score a certain percentage was unnecessary. Looking at the matter from this point of view it was not difficult to appreciate the plaint of a farmer at a recent hearing on the milk situation held at the State House wherein he stated "a mess of doctors have got together and made up a score card for us farmers and published their findings" and he proposed that the farmers get up a score card for the doctors and publish the findings and said he, "then see what will happen to some of them."

The court work incident to a proper enforcement of milk rules and laws is not its most uninteresting feature; during the local board's participation in sanitary inspection for 6 years and Statute law inspection for 3 years, six cases have been prosecuted for violation of the regulation fixing the limit of bacteria permissible in milk intended for sale at 500,000 per cubic centimeter and fined a total of $250; 18 cases were brought on account of added water to milk and fined a total of $1750; three on account of skimmed milk and fined a total of $150, and but one case for milk below standard merely which was fined $20.00. Convictions have been secured in all cases brought to court.

It may not be amiss at this point to voice out belief that Brockton's milk supply has reached a high standard of cleanliness: the average bacterial content of milk collected from dealers' wagons in 1906 of 820,000 per cubic centimeter being lowered to 273,000 by 1911. From 20 to 30 out of the total of 94 wagon dealers finish each year with an average of below 50,000, and many have completed a year with an average count of below 10,000 for their product. While this indicated on the whole a clean milk supply it was observed that occasionally deaths of infants would occur in families supplied with the best milk which lead the board to health to feel that to further minimize infant mortality more must be done than to make and enforce milk regulations and that it was essential to educate the family in the proper care of clean milk after it is left at the door. Just how far to go appeared a delicate matter, but a four-page circular was drawn up and is sent to every home from which a birth is reported. Two pages are devoted to the care and feeding of the infant, one page to the proper care of milk in the home, and the last page was a reprint of the article "Beware of Flies," authorized by the Mass. Association of Boards of Health. These circulars were first sent out in the summer of 1911, and while it may be merely a coincidence, we believe the low infant mortality in Brockton

last summer and fall to be due in large part to the influence of this circular. The average infant mortality for the fourteen years ending with 1910 was 104; that for the year of 1911 was but 80.

In 1909 the work of the Health Department side of the laboratory having increased to an extent that rendered both the distance the filter beds laboratory was from the centre and the lack of space it afforded a serious handicap, and taking it into consideration also the not infrequent interruptions of telephone service in the winter time and the lack of the electric current for power and light, it was decided by the Health and Water Departments to jointly establish a laboratory in City Hall where rooms were available through being vacated by the school committee removing their quarters to the new High School building. The chemical work of the Sewerage Department was continued at the filter beds laboratory, the writer being retained in an advisory capacity.

Altogether rooms with about 2000 feet of floor space were made available for the new laboratory, all being on the third floor of the building.

In the round room of the tower, which is 30 feet in diameter is located the main part of the laboratory equipment. In this room there are 8 large windows each of an area of nearly 35 square feet, flooding the room with an abundance of light. Halfway around the room, following the wall has been constructed a semi-circular bench. On this are located the microscope and accessories, a small iron sink, shelves for reagents, the analytical balance and another for coarser weighing, burette-racks, stills and condensers for water analysis, and a combined suction and blast apparatus.

At one end of this long bench is placed the large wooden sink, 6 x 2 feet, the drying racks and drain board and over the sink is fastened an instantaneous water heater with electrical ignition. Next is a small bench with a combination laboratory microtome which can be used for frozen section, paraffin or celloidin work. Adjacent to this is a large refrigerator.

On the opposite side of the room is located a commodious fume closet and on a bench next to this are located the water stills, one continuous and one for redistilled water, a hot-air sterilizer, a "multiple-unit" electric furnace and a large water bath.

In the centre of the room are located 4 large benches fitted with drawers and closets. On one is located the 37½° incubator and a battery of 8 Sedgwick-Rafter filters.

On another bench is located a Freas electric drying oven, a rotating-anode electro-analysis apparatus and a calorimeter.

A third bench, which is 17 x 3½ feet on top, and is fitted with 72 drawers and 14 closets, (secured gratis from the old High School building.) besides being piped for gas is used for the miscellaneous work and upon it also is kept the polariscope, a Schmidt & Haensch half-shadow instrument, and

the viscosimeter. The fourth bench accommodates a Simplex electric oven and an expansion closet for use in flour testing.

A large double closet, fitted with drawers below and glass front above standing near the centre of the room is used for the storage of chemicals and apparatus.

On a small bench fastened to the wall and braced with iron bars is located an electrically-driven centrifuge, used in both chemical and bacterial examination of milk samples as well as in general work, interchangeable heads being provided.

An autoclave and an Arnold sterilizer are also included in the equipment of this room. The twenty degree incubator is placed in a small closet next to the refrigerator, the waste water from which is conducted through the double wall space of the incubator, the temperature of which is then kept at 20° by means of a Lautenschlager thermoregulator.

A small room adjoining holds a Fairbanks cement-testing machine, mixing table and storage closet, a grinder for preliminary crushing of coal samples and a set of sieves for the mechanical analyses of sand. Another small room has been constructed for a dark room and fitted with the usual conveniences.

In the office are located the desks of the director of the laboratory and the clerk, filing cabinets, safe, and book cases containing a technical library of some 400 volumes. On the walls are framed pictures inscribed also with the records of the dairies leading the list of clean milk producers since the inauguration of that work in 1906.

The work of the laboratory, as present conducted, falls under the following headings:

Bacteriological Diagnosis.
Bacteriological milk examinations.
Chemical milk examinations.
City water supply examinations, chemical, bacterial and microscopical.
Coal analysis.
Oil examinations, both lubricants and road oils.
Cement testing.
Analysis butter, cheese and vinegar.
Flour testing.
Disinfectant testing.
Pathological examinations of specimens from abattoir.
Examinations for Police Department and miscellaneous work.

The methods employed are as nearly as possible those adopted by the several national societies. Thus the bacteriological examinations are conducted as recommended by the special committees of the American Public Health Association. Water analyses, chemical and bacterial and bac-

terial examinations of milk are made according to the reports of the special committees on standard methods.

Coal is examined according to the method recommended by the American Chemical Society, and cement by the standard specifications of the American Society for Testing Materials.

Butter, cheese, vinegar and other food materials according to the methods of the Association of Official Agricultural Chemists.

Disinfectants by both the Hill glass-rod and the Rideal-Walker drop methods.

For flour there appears to be a multiplicity of methods all having their advocates, some of whom earnestly belittle the specifications of others. The scheme adopted is that given in an article appearing in the Journal of the American Chemical Society, Vol. 29, pp. 910–921, which investigates both the chemical and baking qualities of the sample.

Last year some 4183 examinations were made for the Health Department, divided as follows: diphtheria 225; tuberculosis 678; typhoid fever 175; malaria 60; other diseases 136; typhoid carriers 29; water analyses 18; bacterial milk exams. 1298; chemical milk exams. 1381; butter, cheese and vinegar 183; while for the Water Department 527 examinations were made, as follows: chemical 150; microscopical 166; bacterial 114; coal 40; cement 57; these two departments, the largest contributors sending together 4710 examinations to the laboratory.

During the past ten years over 19000 examinations have been made, this including milk work for about half of that time, which, for a city the last census credited with a population of about 57,000, indicates a desire to know "where they are at." The figures as given do not include the analyses made for the Sewerage Department at the filter beds laboratory.

The laboratory force consists of a director, one assistant, one clerk and one volunteer assistant, who is preparing for a government examination.

If this record of the Brockton laboratory, sketched in this reminiscent manner, serves to indicate to any beginner the lines of municipal laboratory work that may be advantageously taken up, its purpose will be achieved.

STATISTICS REGARDING INCREASED NUMBER OF THROAT INFECTIONS IN BOSTON FEBRUARY, 1912

Wm. Pearce Coues, M.D.,
Boston

Read before to Massachusetts Association of Boards of Health, Boston, April 25, 1912

Early in February, 1912, a sudden increase of acute throat infections, usually more prevalent at this season, than any other, was noted in Boston. Some of the cases seemed to have a striking similarity to those of the May 1911 outbreak in and about Boston. The bulk of the cases occurred during the week of February 10–17. Many of the serious cases were treated in this period. The Board of Health sent out the following letter February 15, 1912.

"Dear Doctor: Will you please report to the Board of Health all cases of tonsillitis that have occurred in your practice since the 10th instant, and when possible give the milk supply and state whether or not it is pasteurized.

Very truly yours,
P. H. Mullowney,
Commissioner."

Two hundred and twelve replies were received by the Board of Health dealing with 227 Boston cases. Very few of these cases were reported as occurring before February 10th. These are included in the general statistics. Most of the letters came in from February 15 to March 3d. One physician reported 43 cases of acute tonsillitis or septic sore throat occurring within a short period of time in February. Twenty-nine of these cases were on one milk supply, unpasteurized. Fourteen were on different supplies. Among these 14 cases there were no bad throats. Most of the bad throats and all of the streptococcus ones showed an exudate ordinarily covering the whole throat and in some cases extending on to the lips. No such throats were seen in this physician's practice before February 10th. None were seen after February 17th.

A physician in a neighboring city who had many cases of throat infection in May 1911, said that he had had 12 cases in a short space of time in February, nine cases between February 9 and 15. Three of these developed peritonsillar abscesses. Nine of these were on one milk supply, unpasteurized, the same as the 29 cases reported above in the Boston epidemic. Of the 227 cases reported in Boston, it was found that in 21 the milk supply could not be definitely ascertained after considerable search, thus leaving 206 cases with definite and known supply of milk. These were divided thus:

Dairy	No.	1.	100	cases,	or 48.5 per cent.
"	"	2.	22	"	10.6 " "
"	"	3.	15	"	7.3 " "
"	"	4.	7	"	3.4 " "
"	"	5.	6	"	2.9 " "
"	"	6.	5	"	2.4 " "
"	"	7.	4	"	1.9 " "
"	"	8.	3	"	1.4 " "
"	"	9.	3	"	1.4 " "
"	"	10.	3	"	1.4 " "
"	"	11.	3	"	1.4 " "
"	"	12.	3	"	1.4 " "
"	"	13.	3	"	1.4 " "
"	"	14.	2	"	.9 " "
"	"	15.	2	"	.9 " "
"	"	16.	2	"	.9 " "
"	"	17.	2	"	.9 " "
"	"	18.	1	"	.4 " "
"	"	19.	1	"	.4 " "
"	"	20.	1	"	.4 " "
"	"	21.	1	"	.4 " "
"	"	22.	1	"	.4 " "
"	"	23.	1	"	.4 " "
"	"	24.	1	"	.4 " "
"	"	25.	1	"	.4 " "
"	"	26.	1	"	.4 " "
"	"	27.	1	"	.4 " "
"	"	28.	1	"	.4 " "
"	"	29.	1	"	.4 " "
"	"	30.	1	"	.4 " "
"	"	31.	1	"	.4 " "
"	"	32.	1	"	.4 " "
"	"	33.	1	"	.4 " "
"	"	34.	1	"	.4 " "
"	"	35.	1	"	.4 " "
"	"	36.	1	"	.4 " "
"	"	37.	1	"	.4 " "
"	"	38.	1	"	.4 " "

206 cases.

Pasteurization and dates of cases occurring on different Dairy Routes.

No. 6. Five cases, Feb. 12, 14, 16 and 19. . . . Definitely stated that milk was unpasteurized in all cases before that reported on February 19.

" 7. All unpasteurized. Four cases. . . . . Feb. 11, 2 cases.
Feb. 12, 1 case.
Between Feb. 12 and 18, one case.

" 13. Two cases. . . . . Pasteurization not stated. Exact date of sickness not stated.

" 17. Two cases from Feb. 10 to 26. . . . . Unpasteurized.

No. 11.	Three cases, unpasteurized	Feb. 7 to 26th.
		One case between the 10th and 26th.
" 14.	Two cases, unpasteurized	One case Feb. 13.
		One case Feb. 10.
" 10.	Unpasteurized, 3 cases	Feb. 12 to 16th.
		One case, date unknown.
" 9.	Three cases	One case between Feb. 10 and 20.
		One case Feb. 12.
		One case, time not stated.
		This milk was all probably pasteurized.
" 13.	Three cases, unpasteurized	Feb. 12, 13, 14.
" 5.	Six cases	Feb. 13, one case.
		Feb. 16, one case.
		Between Feb. 10 and 20, two cases.
		Time not stated, 2 cases.
		The milk supply of these cases was probably pasteurized.
" 16.	Two cases, unpasteurized	Feb. 18, one case.
		One case, time not stated.
" 8.	Three cases, unpasteurized	Feb. 10, one case.
		Feb. 13, one case.
		Not stated, one case.
" 4.	Seven cases	Feb. 12, one case.
		Feb. 13, one case.
		Feb. 17, two cases.
		Feb. 20, one case.
		Time not stated, 2 cases.
		The milk taken by all the persons in this list was probably pasteurized.
" 2.	Twenty-two cases	Feb. 10, 5 cases.
		Feb. 12, 5 cases.
		Feb. 13, 1 case.
		Feb. 14, 2 cases.
		Feb. 15, 1 case.
		Feb. 16, 2 cases (One had two sources of supply).
		Feb. 17, 2 cases.
		Time not stated, 4 cases.
		Milk probably pasteurized in 17 cases.
		Stated definitely to be unpasteurized, 5 cases.
" 3.	Fifteen cases	General supply mostly pasteurized.
		Feb. 10, 2 cases.
		Feb. 12, 2 cases.
		Feb. 13, 2 cases.
		Feb. 15, 2 cases.
		Feb. 16, 1 case.
		Time not stated, 6 cases.
		Of these 15 cases, 14 were definitely stated to have unpasteurized milk.

No. 18. One case, unpasteurized, Feb. 12.
" 19. One case, unpasteurized, Feb. 12.
" 20. One case, unpasteurized, Feb. 13.
" 26. One case, unpasteurized, Feb. 17.
" 25. One case, Feb. 8, pasteurization unknown.
" 21. One case, unpasteurized, date unknown.
" 37. One case, unpasteurized, Feb. 16.
" 36. One case, unpasteurized, date not known.
" 35. One case, unpasteurized, between Feb. 12 and 17.
" 34. One case, unpasteurized, Feb. 17.
" 33. One case, unpasteurized, Feb. 14.
" 32. One case, unpasteurized, Feb. 12.
" 31. One case, pasteurized, Feb. 11.
" 30. One case, unpasteurized, date unknown.
" 29. One case, unpasteurized, Feb. 16.
" 28. One case, unpastuerized, Feb. 10.
" 27. One case, unpasteurized, Feb. 10.
" 24. One case, unpasteurized, Feb. 15.
" 23. One case, unpasteurized, Feb. 12.
" 22. One case, unpasteurized, Feb. 11.
" 38. One case, unpasteurized, Feb. 16.
" 1. One hundred cases . . . . . This Dairy began pasteurizing all its milk from one source, the home source, Feb. 17. The other supply was not pasteurized until March 10th.

TONSILITIS or SEPTIC SORE THROAT.

5	cases	began	on	Feb. 7.
11	"	"	"	Feb. 10.
6	"	"	"	Feb. 11.
8	"	"	"	Feb. 12.
2	"	"	"	Feb. 13.
4	"	"	"	Feb. 14.
5	"	"	"	Feb. 15.
5	"	"	"	Feb. 16.
1	"	"	"	Feb. 17.
1	"	"	"	Feb. 19.
48	cases			

17 cases, date of first symptoms was not stated definitely.
71 cases or 71% of the 100 cases occurred between Feb. 10 and 18. They were all on unpasteurized milk.
58 cases, it was definitely known that the milk was from one source of supply.
2 cases from the other source of supply. The remainder undetermined. The great number it is safe to say, of these undetermined cases, were on the first source mentioned.
82 cases, or 82% in which tonsillitis occurred, were taking the milk unpasteurized. But two cases were definitely recorded as taking pasteurized milk.

From a glance at the rough table, it will be seen that of the 206 cases reported, 100 or 48.5% came from Dairy No. 1. Of these cases 82, or 82%

were using the milk Unpasteurized. Seventy-one of the cases occurred between February 10th and 18th.

The next largest number of cases occurred in those taking milk from Dairy No. 2. Twenty-two in number or 10.6%. Seventeen were probably on Pasteurized milk, five Unpasteurized. This supply is usually Pasteurized unless stated that the consumer wishes Unpasteurized or special milk.

The next largest number, Dairy No. 3, 15 cases, or 7.3%. This milk supply is, as a rule, Pasteurized. Out of the 15 cases occurring, all but one was stated to have Unpasteurized milk.

The next largest number, Dairy No. 4, 7 cases, or 3.4% were probably taking Pasteurized milk.

The next, No. 5, 6 cases, or 2.9%, the milk was probably Pasteurized.

The next, No. 6, 5 cases, or 2.4%, it was Unpasteurized. One case doubtful.

Next, No. 7, 4 cases, or 1.9%, all Unpasteurized.

Next, No. 8, 3 cases, or 1.4%, all Unpasteurized, and so on.

1.4%, .9% and .4% of the cases were scattered though many dairies.

Of these cases, 106 in number, the supply was found to be Pasteurized in 33 cases, Unpasteurized in 59 cases and 4 undetermined. Of the 21 dairies having one case each, none of the supply was Pasteurized.

1. It would seem from these statistics that there was an increase of the normal amount of tonsillitis usually present in February in Boston.

2. A distinct epidemic occurring, for the most part, in those on one milk supply, presumably due to infection of the supply at sometime about February 10, 1912.

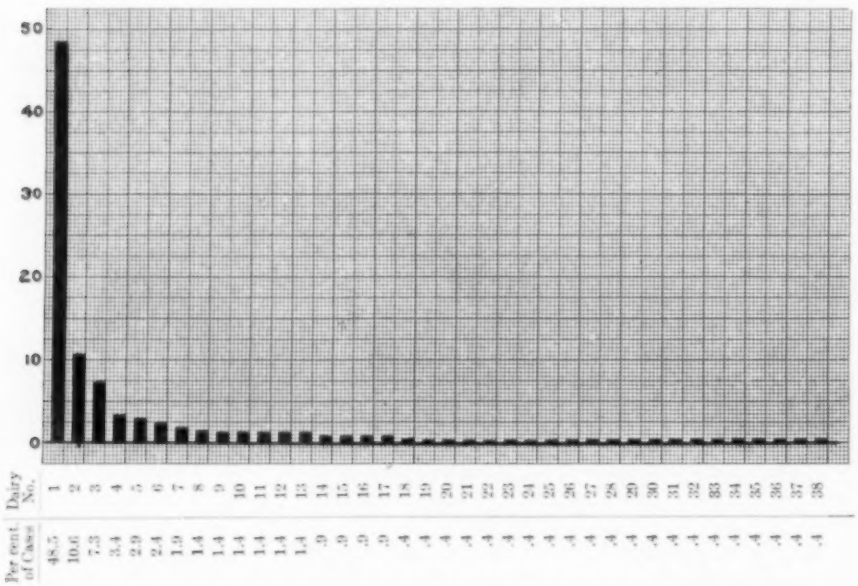
Report of Visit to Plant No. 1.

The first visit was to the receiving station. Here the throats of sixteen men were examined clinically and swabs taken from nose and throat which were turned over to Dr. Arms for examination. All the men showed markedly reddened throats, a number with minute vesicles on the soft palate. One man in the bottling room had a few discreet follicles or plugs on the right tonsil. Examination of the hands was negative in every instance for desquamation or wounds or suppurated places, except in one instance where a capper had wounds protected on his hands.

In watching the bottlers at work it was repeatedly observed that actual hand contact with the milk was at times possible.

The next visit was to the farm proper. Here ten farm hands were examined. The description of each throat in the receiving station and farm will be found in the enclosed report. All the men at the farm had reddened throats though not nearly so marked in some instances as those at

the receiving station. No case of desquamation of hands was seen. The men in the receiving room are occupied largely in damp places handling the milk on concrete floors. This circumstance, exposure to damp, probably has much to do with the pharyngitis which seemed to be universally present. The men on the farm are occupied an hour or so in very dusty lofts each day, getting feed. This may have an important bearing on the throat conditions in some cases. Three of the farm hands, who, I think I am right in saying, were milkers or milked at times, could speak no English. It seems difficult to understand how these men could be made to appreciate the fact of the importance of clean milk, though the records of the counts



of the milk show that they must be careful and cleanly milkers, certainly in most cases.

To sum up, 26 men were examined. Swabs from the nose and throat of these men were sent to Dr. Arms and carefully examined clinically. No case of desquamation of the hands or other lesion was found.

In looking for possible sources of trouble from the milk supply,—from statistics gathered from the reports sent in to the Board of Health,—there seemed to be two sources of possible transmission of infection.

(1). In the possibility of direct contact with the operators' hands when the bottling of the milk was observed by me from the glass windows over the room. If the operator had a septic throat infection the milk supplying

some bottles could be easily contaminated, and if this milk was sent out Unpasteurized, trouble could easily follow.

(2). The milkers' hands. The milk counts and general cleanliness of the milk is well known. At the same time, three of them apparently knew no word of English. It seems as though it would be difficult for such men to always realize the very great importance of the strict rules for milking which are undoubtedly given there. Not one of the men examined had a clinically normal throat. In the receiving station severe pharyngitis, dark red throats the color of raw beef, without exudate, was the rule. Generally without symptom. The constant exposure to the dampness may have something to do with this. The condition is of great interest in relation to the susceptibility of individuals with such throats to a virulent infection. All vesicles on the soft palate, which were quite common, were of interest. The oedema of the uvula, which was too constant to be without interest, was seen more in the men in the receiving station than at the farm. One of these men who was occupied in loading and general work had an acute sore throat around February 9–10, 1912. One of the men, who is a general man, had a beefy red throat and oedema of the uvula. He had an acute sore throat around May 1, 1911. Another of the men occupied in the butter room, had a beefy red throat and oedema of the uvula and said he had an acute sore throat about two day ago.

SWABS FROM PLANT NO. 1.

Receiving Station.

No.	1. Dumping milk	Slightly reddened throat, Vesicles on palate.
"	2. Washing cans	Chronic pharyngitis. Reddened throat.
"	3. Superintendent	Slightly reddened throat.
"	4. Butter maker	Reddened throat.
"	5. Capping machine	Chronic reddened throat. Exudate on right tonsil.
"	6. Capping machine	Reddened throat. Vesicles on pharynx.
"	7. Filling machine	Reddened throat.
"	8. Pasteurizing room	Diffusely reddened throat.
"	9. General room, handling capped bottles	Slight redness.
"	10. Loading and general work	Red with oedematous uvula. Sore throat around Feb. 9, and 10, 1912.
"	11. Testing and general work	Reddened throat. Chronic Tonsils. Oedematous uvula.
"	12. Shipper of cream	Reddened throat. Oedematous uvula. Vesicles on pharynx.
"	13. General room, handles capped bottles	Sore throat two weeks. Diffusely reddened throat. Oedematous uvula.

No. 14. General man ..... Beefy red throat. Oedematous uvula. Sore throat May 1, 1911.
" 15. Butter room ..... Beefy red throat. Oedematous uvula. Sore throat two days ago.
" 16. Collects samples ..... Beefy red throat. Vesicle.

FARM HANDS.

No. 17. Milker and general washer ..... Very slight redness.
" 18. Herdsman ..... Very slight redness.
" 19. Carries jugs of milk to milk room .... Very red throat. Vesicles.
" 20. Milker ..... Enlarged tonsils, small white spot on rights tonsil. Diffusely red.
" 21. Milker ..... Chronic tonsils. Reddened throat.
" 22. Milker ..... Oedematous uvula. Chronic red throat, (one swab touched outer part of glass tube.)
" 23. Milker ..... Very red throat. Oedematous uvula.
" 24. Milker ..... Slight redness.
" 25. General help, some milking ..... Chronic pharyngitis. Diffused redness.
" 26. Milker ..... Chronic pharyngitis. Vesicles on pharynx.

Dr. Arm's report on the cultures from the employees of Plant No. 1, 26 in number, together with 27 which were obtained from different sources as controls. The report is divided in three classes, those showing many streptococci, those showing a few and those with none.

	Many	Few	None	Total.
Plant No. 1.	4	13	9	26
Controls.	8	17	2	27
The controls were obtained from the following sources:				
M. I. T.	6	6	1	13
Milk Lab'y	0	5	0	5
Bact. Lab'y	2	6	1	9

Considering the number of cases of markedly reddened throats found in the clinical examination of this Plant, it was thought of great interest to visit other Plants to ascertain the clinical condition of the throat and take swabs. This was done in three large Plants which were visited.

PLANT NO. 2.

No. 1. Handles cream ..... Faintest possible redness.
" 2. Taster ..... Very slight redness.
" 3. Butter maker ..... Considerable reddened throat. Vesicles on pharynx.

No. 4. Cream taster.....Very slight redness.
" 5. Cream taster.....Very slight redness. Chronic pharyngitis.
" 6. Taster..... " " " " "
" 7. Taster.....Considerable redness. Oedematous uvula.
" 8. Foreman bottling.....Slight chronic pharyngitis.
" 9. Bottler.....Considerable redness. Vesicles on pharynx.
" 10. Taster.....Very slight redness.
" 11. Filler.....Considerable redness.
" 12. Filler..... " "
" 13. Filler.....Very red throat, oedematous uvula.
" 14. Handles bottles.....Normal except enlarged tonsils.
" 15. Filler.....Very slight redness.
" 16. Filler.....Slight redness. Very enlarged tonsils.

PLANT NO. 9.

No. 17. Handles cream.....Reddened throat. Oedematous uvula.
" 18. Can carrier.....Reddened throat.
" 19. Has charge of testing.....Chronic tonsils. Oedematous uvula, reddened throat.
" 20. Can carrier.....Chronic tonsils. Oedematous uvula, reddened throat.
" 21. Taster.....Very oedmatous uvula, considerably reddened throat.
" 22. General work.....Oedematous uvula, reddened throat.
" 23. Inspects bottles..... " " " "
" 24. Bottle washer..... " " " "
" 25. Counts cases..... " " " " Chronic tonsils.
" 26. Bottles milk.....Oedematous uvula, reddened throat, chronic tonsils.
" 27. Bottles milk.....Oedematous uvula, chronic tonsils.
" 28. Counts cans.....Reddened throat.
" 29. Washes cans.....Oedematous uvula, reddened throat.
" 30. Butter maker..... " " " " Vesicles on pharynx.
" 31. Butter handler.....Oedematous uvula, marked vesicles on pharynx.
" 32. Loading cans.....Chronic pharyngitis.
" 33. Has charge of bottling.....Extremely reddened throat.

PLANT NO. 5.

No. 34. Inspector of capping bottles.....Oedematous uvula, reddened throat.
" 35. Inspector of capping bottles.....Septic finger.
" 36. Foreman milk room.....Reddened throat, oedematous uvula.
" 37. Bottle filler.....Very slight redness.
" 38. Bottling machine.....Oedematous uvula, reddened pharynx.
" 39. Cream handler..... " " reddened throat.
" 40. Dumps milk and cream..... " " " "
" 41. Inspector of bottles..... " " " " vesicles on pharynx.

No. 42.	Empties bottles	Oedematous uvula, very red throat, vesicles on pharynx.
" 43.	Inspects bottles	Oedematous uvula, reddened throat, vesicles on pharnyx.
" 44.	Bottles milk	Oedematous uvula, reddened throat, vesicles on pharynx.
" 45.	Handles empty bottles	Oedematous uvula, reddened throat.
" 46.	Handles empty bottles	" " " "
" 47.	Handles bottles	" " " " Chronic pharyngitis.
" 48.	Inspects empty bottles	Oedematous uvula (very large) reddened throat. Chronic pharyngitis.
" 49.	Inspects empty bottles	Very red oedematous uvula, chronic pharyngitis.
" 50.	Handles bottled milk in chest	Oedematous uvula, reddened throat.
" 51.	Spare wagon driver	" " " "
" 52.	Wagon driver	Very large tonsils, slight redness.

Broth Cultures for Streptococci

April 23, 1912.

	Plant No. 2.	
No. 5.	"	Negative
" 11.	"	"
" 16.	"	"
" 7.	"	Few
" 3.	"	"
" 15.	"	"
" 8.	"	"
" 6.	"	"
" 13.	"	"
" 10.	"	"
" 1.	"	"
" 2.	"	"
" 4.	"	"
" 9.	"	Many
" 12.	"	"
" 14.	"	Practically Pure Culture.
	Plant No. 9.	
No. 25.	"	Negative
" 21.	"	"
" 17.	"	"
" 20.	"	Few
" 28.	"	"
" 30.	"	"
" 32.	"	"
" 33.	"	"
" 18.	"	Many
" 24.	"	"
" 27.	"	"

No. 26.	Plant No. 9.	Many
" 19.	"	"
" 31.	"	"
" 23.	"	Practically Pure Culture.
" 22.	"	"
" 29.	"	"
	Plant No. 5.	
No. 49.	"	Negative
" 39.	"	Few
" 50.	"	"
" 40.	"	"
" 52.	"	"
" 44.	"	"
" 36.	"	"
" 41.	"	"
" 43.	"	"
" 38.	"	"
" 47.	"	"
" 34.	"	"
" 48.	"	"
" 37.	"	"
" 35.	"	Many
" 42.	"	"
" 45.	"	"
" 46.	"	"
" 51.	"	"

In Plants Nos. 2, 5 and 9, where this examination was made, very many reddened throats were found. In all four Plants examined, 77 employees were examined not one had a clinically normal throat. The throats of 17 of the officers and employees of the Board of Health were examined clinically. Of these a considerable number showed a slight redness, two showed considerable redness and one an intensely reddened throat. Only one showed a condition which clinically was at all like the severe grades of pharyngitis with intense redness so common among the milk handlers. These men are working long hours on damp and wet floors often covered with milk and ice and I attribute this extreme degree of chronic pharyngitis to that cause. Many of them when questioned about their throats said that there was absolutely no trouble.

The report of the cultures and the swabs from the last three Plants is as follows:

Plant No. 2, 16 men. Three showed no streptococci, 10, few streptococci, 2, many streptococci and one practically pure culture of streptococci.

Plant No. 9, 17 men. Three showed no streptococci, 5, few streptococci, 6, many streptococci and three practically pure culture of streptococci.

Plant No. 5, 19 men. One showed no streptococci, 13 few streptococci, 5 many streptococci.

It is of interest that one of the cultures was from an unprotected paronychia on the thumb. This last case showed many streptococci. This man was occupied capping bottles and had also an oedematous uvula and reddened throat. Taking all the 77 employees examined in the different plants it was found that 51 or 66.2% showed streptococci in the culture from the nose and throat. Four or 5.1% showed practically pure culture of streptococci from plants 2, 9 and 5.

GENERAL CONCLUSIONS FROM THESE STATISTICS.

The occurrence of so many cases of marked pharyngitis, with or without symptoms, in dairymen and those handling milk is of great interest. The presence of streptococci in so many of these throats with clinical symptoms of inflammation is also of interest. The question arising from their presence, especially from those engaged in handling milk, is, are they virulent? And if so, are they transmitted by carriers, to a milk supply, which is sent out unpasteurized? I conclude that the mere presence of streptococci in these throats may mean much or little. Without virulence tests, their presence cannot be considered necessarily of importance. It seems fair to state from the clinical examination of 77 cases that there is a condition which might be termed dairymen's or milk handler's pharyngitis, incident to the long hours of constant work on the wet floors often covered with ice and milk. It does not seem as if all the scrupulous care and pains taken in the efforts in producing the cleanest possible milk could be unvaryingly successful in an unpasteurized product. It would seem as if direct or nearly direct hand contact with the milk is impossible to avoid in some stage of the preparation. Pasteurization by unit system of small packages (one sealed bottle) seems an ideal method.

I wish to express my appreciation of the unfailing courtesy and help of the managers and proprietors of the different milk plants who allowed me to make these examinations for the Board of Health.

TYPHOID FEVER IN NEW YORK CITY TOGETHER WITH A DISCUSSION OF THE METHODS FOUND SERVICEABLE IN STUDYING ITS OCCURRENCE

(Continued.)

CHARLES F. BOLDUAN, M. D.,

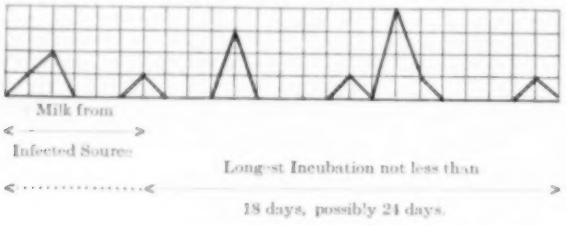
Assistant to the General Medical Officer, Department of Health of the City of New York

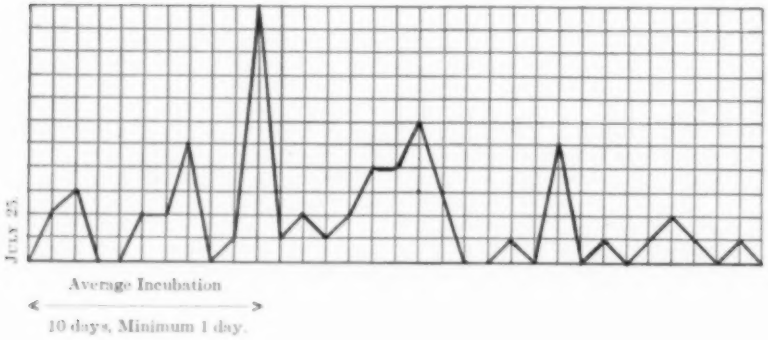
THE STUDY OF THE DATA OBTAINED.

The main value of exact knowledge concerning the dates of onset, and the occurrence of single or multiple infections is in the light these facts throw on the time infection occurred. There is still considerable difference of opinion concerning the average duration of the period of incubation. As in other infections, the period of incubation varies with the size of the dose, the virulence of the infecting organism, and the resistance of the infected individual. There is reason, therefore, for holding that milk infections will, in general, have a shorter incubation than water-borne infections, because with milk constituting such an excellent medium for the growth of the typhoid bacillus it is natural to believe that the number of bacilli introduced will be greater in milk-borne infections. The shortest incubations I have observed was in the case of a milk infection. It is not often possible that the date of infection, and thus the period of incubation, can be accurately established, so that the following occurrence may be of interest:

In a recent milk-borne outbreak of typhoid fever in this city, milk from the creamery to which the infection was finally traced was first shipped to the affected district on July 25th, and, so far as part of the cases is concerned, was not shipped after July 31st. Since the first case (in an institution for children) developed on July 27th, we must assume that the first shipment, that of July 25th, was infected. As this milk was consumed on the morning of the 26th, we have here an incubation of about one day. From the following curve of the onsets, it is difficult to determine whether infection occurred but once or was repeated. It is certain, by examining the second curve in which are shown those cases in which the milk from this particular creamery was received only for the six days

from July 26th, to August 1st, that the maximum incubation period cannot have been less than eighteen days, and may have been as long as twenty-four days.





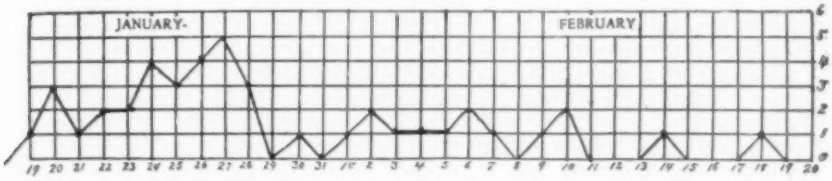
In addition to these uses of a tabulation of dates of onset, there is another which occasionally proves of great value. In tracing an infection, for example, to a certain milk supply, and thence back into the country, one may find that there is considerable typhoid fever in the district from which the milk is drawn. A comparison of the dates of onset of the two sets of cases at once shows whether one can make the country cases responsible for the city cases, or whether both must be traced to a common source. It is very unlikely that the two sets of cases are unconnected in some way.

This use of such tabulations is illustrated in the following:

Water-borne outbreak of typhoid fever due to infected Croton water; a group of cases in the watershed, with onsets coinciding with those of the city cases. Croton water the only factor common to both groups. All the cases, therefore, due to a common cause, as was finally established with a reasonable degree of certainty.

Week ending	Cases of Typhoid Fever in Manhattan and Bronx 1907 Arranged by Onsets*		Onsets of the Watershed Cases for Comparison
		Normalized Average	
Jan. 5	19	21	
12	25	21	
19	20	19	
26	45	13	
Feb. 2	31	17	1 case
9	35	18	
16	27	17	
23	33	14	1 case
March 2	40	17	5 cases
9	85	15	1 case
16	107	12	2 cases
23	31	15	
30	63	15	
April 6	87	12	
13	78	15	
20	64	17	

Milk-borne outbreak of typhoid fever; a group of six cases in the village from which the milk came. Dates of onset of village cases coincide with those of the city cases. All finally traced to a chronic bacillus carrier.



The onsets of the village cases were:

January 20th — one case.
January 24th — one case.
February 1st — three cases.
February 7th — one case.

A tabulation of the age groupings should also be made of all the cases probably belonging to the outbreak being investigated. This frequently aids in deciding on the probable medium of transmission. In milk-borne outbreaks the proportion of children affected is relatively greater than in water-borne outbreaks. Naturally, one must take into consideration the age grouping of the entire population from which the cases are drawn. Thus an age grouping of the cases occurring among the soldiers would have absolutely no value for the purpose mentioned. Similarly, in an outbreak in an institution for children it is a waste of time to make such an age grouping. But if the cases occur in an ordinary mixed population, such an age grouping of cases affected often gives valuable information. The following is an example of the difference between the two kinds of outbreaks:

* These figures are merely the reported cases moved back 2 weeks.

	Under 5	5-9	10-14	15-19	20-29	30-39	40 and over	Total
Milk borne Outbreak.								
N. Y. Feb., 1910	3	7	5	6	14	4	3	42
N. Y., July 1911	1	14	17	8	33	19	7	99
Bronx, Aug., 1911	3	3	7	2	4	2	2	23
For Comparison								
All cases, N. Y., 1907	36	82	255		347	180	100	1 000

It goes almost without saying that for the purpose of study one will undertake a number of tentative tabulations of various kinds, and then when the cause of the outbreak is definitely fixed, make final tabulations embracing only the cases known to belong to the outbreak in question.

The main object of several of the tabulations here outlined is to discover as promptly as possible any unusual occurrence of typhoid fever in the city to the end that the necessary steps may at once be taken to check the outbreak. It is to be regretted that we have to speak of any "normal" occurrence of typhoid fever, but while the statement is often made that typhoid fever is a filth disease whose occurrence indicates neglect of proper precautions, all who have studied the disease carefully take a much more charitable view of the situation. For this reason the studies here outlined concern themselves with an abnormal occurrence of typhoid fever, leaving for future study the problem of entirely eradicating the disease.

While it is obviously impossible to describe in detail all the steps to be taken in the investigation of the source and mode of transmission of this infection, I hope in the following to outline some of the more important considerations which should guide the investigator.

PURELY LOCAL CAUSES.

If the tabulation of the ward returns shows the increased number of cases to be limited to a single ward, and especially if the map shows that the cases are confined to a very small territory, it is well to hunt first for a purely local cause, such as infection from a milk shop, an infected well (if in the suburbs), out-door privies, vacant lots littered with rubbish, garbage and fecal deposits, from which infection could be spread by fly transmission.

If several of the cases get their milk from the same milk shop the most searching inquiry must be made concerning any febrile disease which might have been typhoid fever, in any one handling the milk or even merely in the household. It is well to inquire first merely concerning *any* illness; who the family physician is; when he attended the family; what ailment. It is important to go into the history of any illness that lasted a week or more or that confined the patient to bed. Cases of typhoid fever are

sometimes diagnosed as malaria, or intermittent fever, or slow fever, or grip. The investigator must try to satisfy himself that no typhoid history has escaped him. The fact that jaundice and also gallstones are in some instances associated with a previous typhoid infection must not be overlooked. I once saw an epidemic of water-borne typhoid fever* embracing, perhaps, one hundred cases in which about twenty per cent. of the patients had marked icterus. A number of typhoid bacillus carriers reported in the literature have been sufferers from gallstones. If it is impossible to discover any trace of typhoid infection about the home or among the help of the shopkeeper the inquiry must be extended to the other occupants of the house in which the store is located. Inquiries concerning the occurrence of a possible typhoid infection in the immediate neighborhood must also be made.

If the cases are practically all in one house, there is a possibility of a tank of water on the roof being infected;† or the patients may all have gone to the same ice cream store, or they may have been infected from a previous mild and, therefore, unrecognized case. The possibilities are many and it is well to listen to the clues suggested by the neighbors as now and then they prove correct.

MILK DATA.

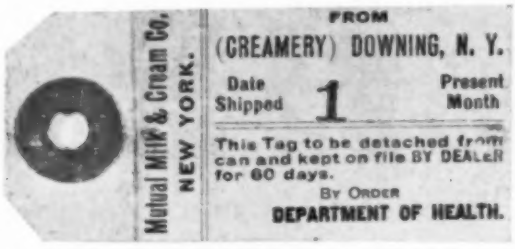
In the successful investigation of milk-borne outbreaks of typhoid fever, in a large city certain features of the administrative control of the milk supply are practically indispensable. There must be some system of recording at all times where a given supply of milk sold in the city is shipped from. While, undoubtedly, this can be accomplished in a number of different ways, I shall here describe the method which has been gradually developed in New York City and which in the main has worked satisfactorily.

No milk may be sold in New York City except under a permit in writing from the Department of Health. Compliance with all the rules and regulations is one of the prime conditions governing the granting of such a permit, and the permit may be removed for cause. It is hardly necessary to say that a permit is only issued after the Department has satisfied itself that the conditions surrounding the sale and keeping of the milk are sanitary. Moreover, every case of infectious disease occurring in the family or household of the storekeeper holding a permit to sell milk must at once be reported to the Department, whereupon an inspection is at once made to make certain that the patient is properly quarantined and the milk supply

* Typical typhoid bacilli isolated from the stools.

† This was the cause of a small group of cases studied some years ago by Park, and due to infection with paratyphoid bacilli.

in no way endangered. The companies shipping milk into the city, who are themselves under control of the Department of Health, are compelled to tag each can of milk with a tag showing the creamery (shipping station) from which the milk was shipped and the date of shipment.



NOTE: In place of the date "....Present Month" as shown on this tag, the Department of Health now requires the full date, thus "July 1, 1912."

In addition to this, they are required to keep a record of the distribution of this milk to the various retailers. In the case of bottled milk each bottle cap must bear the name of the creamery or bottling plant together with the date. The company must also have accurate records to show, in the case of country bottled milk, on what wagons and routes the milk of the various creameries was distributed. The retail dealer is compelled to save these tags for sixty days: *i. e.*, he must always have on hand the tags for the last sixty days. In tracing out a milk-borne outbreak of typhoid fever, therefore, it is a simple matter to determine from which creameries milk sold at any given store or stores for the three weeks prior to the onset of the cases, was shipped from.

As soon as the inspector has visited the cases of typhoid fever and has filled out the report card already described, he visits the milk dealer whose supply was used and ascertains from him the wholesaler for this milk, and, in the case of "dipped milk," the creamery tags for each of twenty-one-days prior to the onset of the typhoid infection. For this purpose he has a separate "Milk Supply Card" shown herewith.

If the patient secured milk from several stores a separate card is filled out for each store. In the case of bottled milk, since the caps are not saved by the consumer, it is obviously impossible to secure the name of the creamery; this must be traced differently, as will be shown in a moment. From the information secured on these "milk cards" is at once made the typhoid record already referred to, in which each case of typhoid fever is entered against the milk dealer supplying the same. It is important to understand clearly that this in no way implies that the milk caused the infection; the tabulation is made for the purpose of discovering the occurrence of any unusual number of cases of typhoid fever among the customers

of a given milk dealer. As soon as an apparent increase is noted a special investigation is undertaken to discover whether this milk was the responsible factor. The tabulation sheet, it will be noted, shows, after the dealer's name, the approximate daily sales, in quarts, and also shows whether the milk was pasteurized or raw.

(CARD)

174 F - 1911 3155-11 (Rg) 5 000

DEPARTMENT OF HEALTH

THE CITY OF NEW YORK

DIVISION OF MILK INSPECTION

Report of Investigation of Milk Supply Where Typhoid Fever Has Been Reported

Name ..... Address ..... Borough of .....

Date of Onset ..... Report to Chief of Division ..... Inspector notified .....

Milk purchased from Store—Wagon of ..... Address .....

IF PURCHASED FROM STORE	IF PURCHASED FROM WAGON
Name	Name .....
Address	Address .....
Amount milk sold daily ..... Pasteurized	Bottle or loose ..... Pasteurized .....
Purchased from	Where bottled? .....
Has any typhoid case been reported in the household of anyone handling milk?	Has any typhoid case been reported in the household of anyone handling milk? .....
Do premises comply with requirements of this Department regulating the care and sale of milk?	Milk received from .....
For tag marks see other side.	

Inspection completed ....

Inspector of Foods.

On the back of this Card there is space for a list of the shipping points, as shown by the tags, that have supplied milk to the supply three weeks prior to the onset of the disease and a record of any Typhoid at the Creameries is noted.

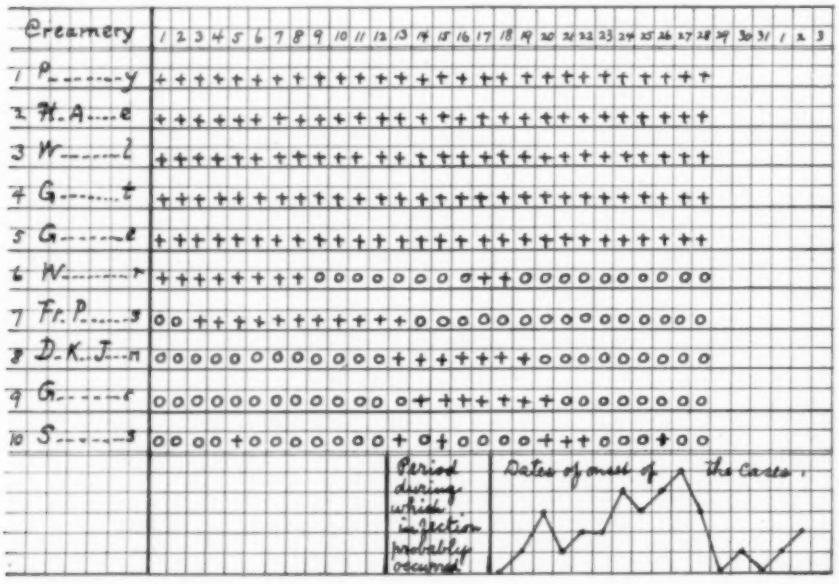
PROBABLE LOCATION OF THE INFECTION.

If the tabulation of the cases charged against each milk dealer (wholesaler) indicates that any particular one is running high, the first point to determine is as to the kind of milk used by the various patients charged against this milk. Was it raw or pasteurized? Dipped or bottled? Shipped direct from the country or filled into bottles or cans in some central creamery in the city? By studying these questions we determine whether to look for the cause of infection in the city or in the country. If the milk is efficiently pasteurized in some central plant in the city, it is idle to investigate creameries and dairies in the country for the source of infection. Moreover, if the cases appear to be limited to the customers of some small retail dealer leaving unaffected the customers of other dealers supplied with exactly the same milk, it is very probable that a local cause is at the bottom of the infections.

INFECTION TRACED TO THE COUNTRY.

If the preliminary orientations indicate that the infection resulted in the country, steps must at once be taken to discover where the infection is located. In the case of "dipped" milk received by the retail dealer in cans as shipped from the country, we make use of a simple tabulation of the names of the creameries as found on the tags kept in the milk shop supplying the patient during the three weeks prior to the onset of the disease. In the case of country bottled milk a record of all the creameries shipping to the depot from which the infected supply was distributed is obtained from the company. This is arranged somewhat as follows:

CREAMERIES SHIPPING MILK TO THE AFFECTED DISTRICT, NEW YORK CITY, OUTBREAK JANUARY, '10.
Creameries shipping Milk to the affected district through the large company whose supply was evidently involved.
+ = Milk shipped that day.
O = No milk shipped that day.


JANUARY
Creamery
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3
1 P.....y
2 H. A....e
3 W.....l
4 G.....t
5 G.....e
6 W.....r
7 Fr. P.....s
8 D. K. J....n
9 G.....c
10 S.....s
Period during which infection probably occurred
Dates of onset of the Cases.

The two tabulations may also be used to advantage together, but only, of course, in the case of loose, *i. e.*, dipped milk, as there are no tags to bottled milk.

Attention is naurally paid first to the creamery suggested by these tabulations, but if no sufficient clue be obtained at this creamery the others must also be carefully investigated. It is well to assign several inspectors to this work in order to discover and remove the source of infection as quickly as possible.

The preceding tabulation has been introduced particularly because it

shows how appearances may mislead, if one relies too much on devices whose only object is to *suggest* clues. It will be seen by glancing at the curve of onsets that the infected milk probably came into the city some time between the 13th, and 18th of January, and it was natural to think that this showed the infection to have been carried in from one of the last three creameries on the list. Number six was also suspected, but inasmuch as it had shipped regularly until the 8th of January, appeared less likely as a source of infection. Despite these rather marked indications, it was conclusively established that Creamery No. 1 on the list was the one from which the infection was carried. Yet this creamery had been shipping regularly to the same district in the city for several years.

THE HEALTH CONDITIONS IN THE TOWN WHERE THE CREAMERY IS LOCATED.

Arrived at the town where the creamery is located the first inquiry to be made is as to the occurrence of typhoid fever in the town or country roundabout. The manager of the creamery is generally in touch with the local physicians and may have knowledge of such infections. The local health officer must also be questioned. It often happens that cases of typhoid fever occur without being reported to the health officer, and it is well, therefore, to visit all the physicians and also make inquiries of the hotel proprietor. At the livery where the team is hired to take the investigator to the various farms one can sometimes pick up valuable clues.

If any typhoid infections have occurred recently in the village or surrounding country careful inquiries must be made to determine whether they have any connection with the infection of milk sent to the city. The plan of such an inquiry is the same as that already discussed and embraces data as to age, date of onset, milk and water supply, other causes, etc. The important point to determine is whether the case or cases in the village originated from the creamery infection, or from the same source as that, or whether the village case brought infection into the creamery. I have elsewhere * called attention to the interesting milk-borne outbreak in this City in which a group of cases developed at the same time in the village where the creamery was located. In this instance all the cases were finally traced to the same cause, a chronic bacillus carrier.

In tracing another milk-borne outbreak,† which also proved to be due to a bacillus carrier, I incidentally was able to explain the undue prevalence of typhoid fever in the village during the past twenty-five or thirty years. The carrier whom I there discovered was one of the local milk dealers, sharing the business of the village about equally with two others. On

* New York Medical Journal, December 30, 1911.

† Journal of American Medical Association, Jan. 6, 1912.

looking back over the typhoid fever cases in the village, numbering from fifteen to twenty annually in a population of 2500, it was found that by far the greater number had been users of this dairyman's milk.

THE CREAMERY.

The regulations of the Department of Health require all creameries shipping milk into New York City to keep on file a weekly report of the occurrence of infectious diseases on each dairy supplying milk to that creamery. It goes without saying that the notification of such a disease is followed by the immediate adoption of precautions to avoid infection by the temporary exclusion of the dairy's milk. As soon as it is ascertained that the precautions taken are entirely sufficient to safeguard the milk supply from that dairy, it may again be received at the creamery. In seeking for a cause of typhoid infection, therefore, the inspector examines first of all the reports concerning the recent occurrence of infectious diseases. Note should be made of *any* infectious disease, even for example, of pneumonia, for it now and then happens that the diagnosis of the attending physician is far from correct.

It is well to examine the list showing the amount of milk brought to the creamery by each farmer each day. Obviously any sudden increase in the amount brought must be looked into. If it corresponds to the time of calving on the farm it has no particular significance; but, if not, it may indicate that the farmer is surreptitiously bringing along the milk from a neighboring farmer whose supply has been shut out. Moreover, even if the neighbor's supply had not been shut out, it is against the rules to bring milk from a farm not regularly entered at the creamery as supplying milk and certified to as meeting the requirements of the Department of Health.

Next a careful sanitary survey should be made of the creamery and its surroundings, in order to discover, if possible, whether infection could have been carried from an exposed privy, from a near-by open sewer, or from fecal deposits elsewhere near the creamery. The water supply must be looked into. The prevalence of flies and the existence of a near-by stable are to be noted. The condition of the receiving room, and the manner of handling the milk demand careful consideration. The workers in the creamery should each be very closely questioned as to a possible typhoid infection in the past. Inquiry must be made concerning any changes in the personnel within recent months, or the employment of additional help either during a rush period or in place of some one temporarily absent. Any absence, of course, is to be investigated. There are so many possibilities that it is useless to send anyone but a trained investigator to do this work.

If the creamery bottles its milk it is well to examine carefully just how

the bottles are cleaned and how they are sterilized. It is conceivable that a bottle of milk supplied to a typhoid fever patient in the city becomes infected there and when returned to the creamery in the country if not properly sterilized carries infection into the creamery. It is obvious that such a chain of events is practically impossible to trace and, personally, I have not encountered an instance where such an infection seemed at all likely. What appears to be an authentic instance of this mode of infection is reported by Whipple and concerns an outbreak of typhoid fever in Montclair, N. J., some years ago.

The total amount of milk shipped from the creamery should be ascertained and inquiry made as to the destination of the same. Some creameries may ship part of their milk to one city and part to another. If the milk is infected one would look for typhoid infection in both. Nevertheless the absence of infection in the second city does not necessarily preclude infection of the milk at the creamery. Most creameries receive their milk in large vats directly it has been weighed, and from this vat it is strained and filled either into cans or bottles. It is perfectly possible for the milk received first to have been all weighed, strained, and bottled (or canned) before the milk coming from the infected farm reaches the receiving room. Only in this way is it possible to explain why typhoid infection sometimes does not follow the entire output of a given creamery in its distribution in the city.

THE DAIRIES.

Investigations at the creamery may have given so direct a clue to the dairy infected that this will at once be visited. However, if no such clue is encountered, every dairy supplying milk to that creamery must be visited. After a sanitary study has been made of the water supply, the location of the privy, the location and condition of the spring house, the conditions about the cow stable, and especially the conditions surrounding the handling of the milk, attention should be directed to the medical history of all the persons on the dairy farm. As already pointed out in discussing the medical histories of those having milk shops in the city, every illness that may possibly have been typhoid fever must be inquired into.

The inquiry must go back through the entire lifetime of each individual. I have traced a milk-borne outbreak of typhoid fever to a chronic bacillus carrier who had his typhoid infection forty-six years previously while a lad out West. The previous occurrence of typhoid fever on the dairy farm even if not in any member of the present occupants may have some bearing; for it is possible that the disposal of the stools at that time was such as to account for infection at the present time. Sometimes the source of infection is found in a neighboring farm. In the case of the typhoid carrier just mentioned this was the case. He was the local milk dealer for the

village and did not ship to the creamery. His son-in-law, also a dairyman, lived a short distance down the road, on the way to the creamery and shipped all his milk to the creamery. In the family of the father-in-law there had been typhoid fever many times during the past thirty years, the last case having occurred just before I visited the town in order to trace the cause of the milk-borne outbreak in the city. The connection between the cases was due to the fact that when the father-in-law returned from his round in the village, he took what milk he had left over, to his son-in-law. The latter mixed it with what he took to the creamery and gave his father-in-law credit each day for the amounts received.

The water supply of the farm demands special attention. If it comes from a well, the nearness to the privy and cesspool are important. The frequency with which the former is cleaned out will give a clue as to whether it is a tight or leaching cesspool; if the privy appears tight the same information will prove useful. Specimens of the water should be collected both for chemical and bacteriological examination. If the water comes from a spring, one should bear in mind that these occasionally fail in dry seasons. Inquiries must be made concerning this and what supply was used when the spring gave out.

The method of cleaning the cans and milk utensils may yield a clue, especially how and where they are drained. Frequently this offers every possible opportunity for flies to infect the utensils from a near-by privy.

In case any one connected with the dairy gives a history of having had an infection which might have been typhoid fever, it is important to secure specimens of urine and stools for bacteriological examinaton. A drop of blood for the Widal test is also desirable. The examination of these specimens is described at the end of this article.

WATER INFECTIONS.

THE MUNICIPAL SUPPLY.

In cities having a public water supply, any infection of this supply would be likely to produce a large number of cases, and, what is of the greatest importance, these cases would largely occur in the area supplied by this supply. In a city like New York, infection of the public water supply would produce infections limited to one of the boroughs, (or in the case of infected Croton water, infections in the borough of Manhattan, and part of the Bronx) for the various boroughs have different supplies. It is important, especially in the outlying districts of a city always to remember that the main public water supply may not reach a given territory. For example, parts of Brooklyn still have comparatively small local supplies, although the main supply is from the Ridgewood pumping station.* If we

*See the maps reproduced in the first part of this article.

1907

Manhattan and Bronx. Typhoid Cases reported each week, by Wards. Normal Incidence in Light Figures.

Week ending	Manhattan																					Bronx	
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th
January 5..	.3	....	....	.1	....	.3	1 .3	.4	.6	.2	.4	8 8.	.2	.1	.3	.6	1 .6	1.1	3 4.	1 1.0	1.8	3 2.	2 3.	2 1.
" 12..	.1	....	....	....	....	.5	2 .7	.5	.9	1 .3	.8	11 8.	.5	....	.3	1 1.	.7	1.3	7 2.	1.1	1.9	3 3.	2 4.	1 1.
" 19..	1 .1	....	....	....	....	.1	.5	1 .6	.6	.3	1.	8 7.	.2	.2	.1	1 .8	1 .6	.6	4.	1 1.4	1 1.2	3 3.	1 3.	1 2.
" 26..	.4	....	....	....	....	.1	.2	1 .2	1 .4	.3	1.4	5 7.	.5	.4	.4	.4	.8	1 .9	5 2.	.8	2 1.0	4 3.	3 2.	1.
February 2..	.0	....	1	.1	.2	.1	.5	1 .3	.2	.4	1 .6	5 6.	.2	2 .1	1 .3	.2	.5	.4	6 3.	.9	2 1.2	3 3.	1 3.	1.
" 9..	.0	....	....	.1	....	.3	.6	.5	2 .6	1 .6	.6	25 5.	....	.2	.3	3 .9	.5	2 .6	2 3.	.7	2 .6	6 2.	2 1.	1.
" 16..	1 .1	....	....	.2	2 .3	.1	2 .8	.1	.3	.4	.5	8 5.	.2	.4	2 .4	3 1.	.4	.7	6 2.	.9	1.	3 2.	4 1.	1.
" 23..	.0	....	....	.1	2 .2	.1	.3	1 .3	1 .5	.4	2 1.0	12 5.	.3	.3	.2	2 .7	.4	.9	4 3.	4 1.4	2 1.6	1 3.	3 3.	1 1.
March 2..	.1	....	....	....	....	....	1 .6	.1	.3	1 .4	2 .5	6 4.	2 .3	.2	1 .3	.6	.6	.2	4 3.	2 1.	4 .7	2 2.	1 2.	1 1.
" 9..	.3	....	....	.3	.1	.1	.7	....	2 .3	1 .3	2 .2	9 5.	.2	.1	.1	.3	1.2	.2	4 3.	1 .9	3 1.3	7 2.	2.	4 1.
" 16..	.1	....	....	....	....	....	.3	.6	1 .3	.3	.3	20 6.	.5	.3	.1	.4	.7	.8	5 2.	1.5	1 .7	11 1.	1 2.	1 1.
" 23..	.0	....	....	1 .2	1 .2	....	3 .3	....	.4	1 .3	1 .7	46 4.	.4	1 .4	1 .4	2 .3	1.0	2 .7	5 3.	2 1.0	3 1.7	10 2.	3 1.	3 1.
" 30..	.3	....	....	.1	.2	....	1 .3	3 .2	3 1.	.3	1 .6	50 5.	3 .7	1 .2	2 .2	1 .5	.7	.6	16 2.	3 .8	4 .7	18 2.	1.	1 1.
April 6..	1 .3	....	....	....	.2	.2	1 .6	.3	.6	.1	.2	39 4.	1 .6	.1	.1	3 .9	2 .9	.3	15 1.	1 .9	9 .2	8 1.	1 1.	1.
" 13..	.2	....	....	.2	.1	.1	2 .3	.3	.1	.4	.5	33 3.	.4	....	.1	2 .5	1 .4	3 .7	7 2.	1.1	1 1.8	5 1.	4 1.	5 1.
" 20..	2 .3	....	....	4 .2	.2	.1	4 .5	.1	.3	.6	2 .4	40 5.	.5	.2	.2	.4	1 .6	1 .7	8 2.	1 1.1	6 .2	6 2.	12 2.	3 1.
" 27..	.2	....	....	.1	....	....	2 .4	.2	.5	1 .4	1 .7	39 3.	1 .1	.3	3 .4	.6	1 .8	1 .6	9 1.	1 .8	4 .9	3 2.	7 2.	5 1.
May 4..	.2	....	....	....	.3	....	1 .4	.2	.4	1 .6	.4	27 5.	.4	.2	....	3 .8	2 .7	1 .4	9 1.	1 2.	1 1.0	10 3.	6 1.	2 2.
" 11..	.4	....	....	.2	....	....	.6	....	2 1.	.8	1 .4	10 2.	....	....	.1	2 .5	1 .6	.5	10 2.	3 1.4	1 .8	5 3.	3 2.	2 2.
" 18..	1	....	....	....	....	....	5 .6	....	1 .3	.2	3 .4	13 5.	1	1	2	2 .9	.3	....	4 2.	1 1.3	2 1.9	5 2.	6 2.	2.
" 25..	....	....	....	....	....	....	.6	....	.6	.3	.5	14 6.	....	....	....	3 .8	1 1.0	....	1 3.	1.2	1 1.0	2 3.	2 2.	2 1.
June 1..	....	....	....	....	....	....	1 .4	....	2 .6	1 .6	2 .4	4 5.	....	....	....	1 .4	1 .6	....	3 2.	.7	1.4	1 3.	4 2.	1.

Normal Incidence not shown for some of the smaller wards.

examine the statistics of typhoid fever in New York for some years past, we shall discover that there is regularly an enormous increase in the number of cases in the second half of the year, succeeded, in turn by a period of decreased frequency. In 1907, however, we note that there was an unusual outbreak of typhoid fever in March and April,* and further examination shows that this was limited to the borough of Manhattan. Investigations made at that time leave no doubt that this was due to infected Croton water. The preceding table shows the ward distribution of the cases occurring at that time, from which it is apparent that the increase affected all the wards in the borough.

In this connection I wish to call attention to the fact that the ordinary daily chemical and bacteriological examinations of the water supply do not necessarily disclose the presence of typhoid infection. I will preface this by saying that Croton water is derived from the Croton River and its tributaries, draining approximately 360 square miles of territory containing several large villages and a number of smaller ones. In certain parts of the Croton watershed there is considerable dairying, the land affording excellent pasturage. Under the circumstances it is not suprising that Croton water often shows colon bacilli in 1 c.c. and now and then also even in 1-10 c.c. It is impossible to say what proportion of these represent human fecal pollution. Knowing that the outbreak of typhoid fever in the borough of Manhattan in the spring of 1907 was due to infected Croton water, it is interesting to examine the following table (see next page) showing the bacterial counts and B. coli in January, February, and March of 1906 and 1907. (From the tabulation of cases, we may safely say that the water must have been infected during January and February.)

It will be observed that there is no real difference in the results obtained at the time of infection and results obtained before and after that time. The point I wish to bring out by this table, is, not that routine analyses are valueless, but that they cannot supplant sanitary surveys in the detection of probable sources of pollution. Moreover, in guarding over a public water supply drawn from a river, lake or other surface water, the public health authorities must constantly have accurate and prompt information concerning the occurrence of infectious water-borne diseases in the area from which the supply is derived, and should be prepared to deal with any cases even remotely endangering such supply.

In connection with the infection of a water supply drawn from streams or lakes, it is well to remember that whenever a lot of day laborers have been working in the territory from which the water is drawn, careful investigation should be made concerning the disposal of their excreta. It is the exception to find these laborers using the sanitaries provided for them, and

* See chart showing the seasonal distribution of typhoid fever in New York in 1907 at the end of this article.

Bacteriological Examinations of Croton Water at the Gate House 135th Street

Right hand column: B. Coli
Left hand column: Bacteria

The B. coli content is expressed by means of three figures, thus 00+, or 0++, or +++, in which the left hand place indicates B. coli in 0.1 cc.; the middle place in 1.0 cc.; the right hand place in 10.0 cc.

1906				1907			
January	February	March		January	February	March	April
.....	000	00+	1	.....	00+	000	00+
.....	340	19,200	1	.....	465	380	00+
000	000	00+	2	00+	00+	.....	000
1,590	825	20,000	2	1,510	400	—	435
00+	000	0++	3	000	000	00+	00+
6,480	375	11,700	3	1,955	260	400	410
00+	000	000	4	000	000	.....	000
5,400	1,285	5,670	4	1,555	380	—	350
00+	000	000	5	00+	000	00+	000
3,800	925	—	5	770	270	375	275
000	00+	000	6	0++	00+	00+	00+
2,100	395	18,300	6	2,550	260	595	215
00+	000	0++	7	00+	000	000	000
4,800	740	31,000	7	—	335	415	200
000	00+	00+	8	.....	000	00+	00+
1,580	815	28,000	8	.....	3,350	450	610
00+	000	00+	9	+++	.....	000	000
1,595	360	17,000	9	2,700	—	415	260
00+	000	00+	10	0++	00+	00+	000
1,580	320	21,000	10	6,520	2,100	470	195
000	000	00+	11	00+	00+	00+	00+
2,200	880	9,900	11	3,800	555	790	220
000	.....	0++	12	00+	.....	00+	000
2,490	—	1,980	12	2,040	—	645	215
000	000	000+	13	00+	00+	00+	000
3,570	815	2,245	13	1,365	520	800	290
000	00+	00+	14	0++	00+	00+	00+
1,830	795	1,680	14	1,810	505	375	210
000	.....	000	15	000	000	000	000
1,230	455	765	15	1,090	375	215	220
000	.....	000	16	00+	00+	00+	000
5,050	730	1,100	16	600	970	510	240
0++	.....	000	17	00+	00+	00+	00+
3,380	1,330	615	17	635	660	635	225
00+	.....	000	18	00+	000	00+	000
2,110	720	465	18	470	520	425	235
00+	.....	000	19	.....	00+	00+	000
.....	385	875	19	—	650	885	525
000	.....	000	20	000	00+	00+	00+
—	390	585	20	340	1,700	1,040	240
000	.....	000	21	.....	00+	00+	000
3,500	350	1,065	21	—	640	710	225
00+	—	000	22	00+	.....	.....	00+
170	—	915	22	630	—	—	150
00+	000	000	23	00+	.....	00+	000
2,350	3,650	3,100	23	250	—	1,780	200
000	0++	000	24	000	00+	0++	000
1,900	2,300	510	24	240	650	5,760	160
000	0++	000	25	000	00+	00+	000
—	2,750	2,600	25	460	470	745	315
000	—	000	26	000	000+	00+	00+
1,500	—	355	26	188	450	830	330
000	00+	000	27	00+	.....	00+	000
375	18,035	1,130	27	480	—	860	155
000	000	000	28	000	00	00+	00+
600	32,000	785	28	275	365	1,030	145
000	.....	00+	29	0++	.....	000	000
405	.....	1,820	29	390	.....	3,040	—
000	.....	0++	30	000	.....	00+	000
300	.....	2,290	30	575	.....	825	—
000	.....	+++	31	00+	.....	000	.....
340	.....	12,715	31	720	.....	685	.....

Courtesy of Dr. Daniel D. Jackson, Director Mt. Prospect Laboratory.

one will do well to hunt around in the bushes, behind fences and walls and the like, for collections of excreta.

Another point to which attention should be directed is the relation of the supply to the demands upon it. This will occasionally lead to the discovery of an additional supply whose use was unsuspected. In a water-borne outbreak of typhoid fever studied some years ago, I finally traced the infection to infected water surreptitiously turned into the regular supply. For the same reason it is advisable to make inquiries concerning any temporary cutting off of the regular supply, and concerning any repairs, break-downs, etc. If the surreptitious use of a particular surface water is suspected it may be possible to establish this fact by adding to the surface water in question some extraneous chemical, like lithium carbonate, and subsequently testing the supply suspected. This method was successfully employed by inspectors of the Health Department, some years ago, in demonstrating the use of a surface water by a company claiming to pump only from deep wells.

In studying the distribution of cases of typhoid fever believed to be water-borne, it may be well to determine, if possible, whether the supply is obtained from a main laid as a "dead end." Some writers, without, it is true, offering much proof, have held that the existence of such dead ends is responsible for a considerable number of cases of typhoid fever.

Another factor to be remembered in water-borne typhoid fever in the city, is the use of storage tanks on the roofs of houses. In repairing or cleaning such tanks it is usually necessary for someone to enter the tank, thus rendering an infection possible. Evidence pointing to this possibility must, however, be examined critically and should not be accepted unless it is very definite.

BOTTLED WATERS.

Before leaving the subject of water-borne infections, it may be well to remind the reader that some of the water at present so largely sold in bottles as "Pure Spring Water" is bottled and handled under conditions which would render typhoid infection comparatively easy. Moreover, the source from which these waters are drawn is not always so unobjectionable as the label on the bottle would indicate. I have not, however, been able thus far to trace an outbreak of typhoid fever to this source.

RAINFALL AND WATER-BORNE INFECTIONS.

In studying suspected water-borne typhoid fever in municipalities using impounded surface water for drinking purposes, attention should be paid to the weather conditions in the watershed during the month preceding the onset of the infections. The literature contains many instances where the

infectious material was washed into the water supply at the time of spring freshets or during heavy rains.

In the light of the last two tabulations, the following record of rainfall in the Croton watershed (Bedford Hills Weather Station)* suggests a direct connection between the rainfall during the first half of January and the infection of the water supply.

Date.	Rainfall, in inches.
Dec. 31, 1906	1.50
Jan. 1, 1907	.08
3	.05
4	.35
8	.25
12	.42
14	.12
15	.03
17	4½ inches snow = .36 inches melted
19	.46

WELL WATER.

It is obvious that infected well water (excluding large wells used for municipal supplies) will always cause small, localized outbreaks of typhoid fever. In an institution, to be sure, the outbreak may assume considerable proportions. In general, however, infection from this source is not readily overlooked. It should be one of the first modes of infection to think of in cases occurring repeatedly about some small locality. It is the rule that the various cases do not all develop at or near the same time, but have onsets spread over a greater or less interval, but of course exceptions to this are frequent.

(To be concluded.)

*Courtesy of Dr. L. Rosenberg, Montefiore Home Country Sanitarium.

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THE INTERNATIONAL CONGRESS ON HYGIENE

The official invitation, extended by the Government of the United States to other nations and to our own sovereign States, having been accepted by twenty-five countries and by forty-seven of the United States, it seems certain that the Fifteenth International Congress on Hygiene and Demography meeting in Washington next September, is a goal of great expectations. Less than this cannot be said, and more need not be said of the undertaking at this time. The mere announcement of great expectations will be found somewhat staggering, if one reflects that our country, in her first adventure of this sort, has proved able to bring the Old World over seas, and to assemble her own great family of States, at the same time, for a first American international congress on hygiene. No other country, perhaps, can evoke so large a response from within its own borders, and no other country has in the past received a larger response from without.

Among the people of the United States, none are entitled to look forward with livelier interest than the members of the American Public Health Association, or with a keener sense of responsibility for the preparations necessary to be made in consequence of the great expectations which we have aroused. Partly in the fact that the Congress is so largely officered by members of the Association, but mainly in forty years of continuous activity in the sanitary affairs of four countries, are reasons found for looking to the Association as a main source of that vitalizing function which will convert to the perpetual use of coming generations whatever saving knowledge the Congress may produce.

The Association will certainly furnish the torchbearers for the four countries. Canada, Cuba, and Mexico are sure to send old friends to Washington in the autumn. Two Canadian Ex-Presidents of the Association have already been named as delegates; Dr. Montizambert, to represent the Dominion Government; Dr. Lachapelle to represent Laval University.

The Association will not hold the only meeting to be held in Washington

during the week of September 16th. The New England Water Works Association, the American Statistical Association, and the Conference of State and Provincial Boards of Health will hold meetings at that time; and during the Congress strong delegations will be present from the Association for the Study and Prevention of Infant Mortality, The Association for the Study and Prevention of Tuberculosis, The American School Hygiene Association, the Federation for Sex Hygiene, the Society of Mental Hygiene, and several other organizations.

There will be no lack of serviceable vehicles in which to freight back to all corners of this land whatever goods the Congress and the Exhibition may deliver. More than an announcement, this event is a challenge of great expectations.

INDIGENT CONSUMPTIVES IN THE SOUTHWEST

A Southwestern Conference on Tuberculosis made up of delegates from the States of Colorado, Texas, New Mexico, Arizona, and California was held in Waco, Texas, in April to consider the situation with regard to the disease in that section of the country.

The facts presented at the Conference reveal a condition of affairs that is intolerable. While exact information is lacking, it is certain that over five thousand persons with advanced tuberculosis migrate annually to the Southwest in hopes of a cure, and of all of those who come it is held that the majority are not only beyond hope of recovery but are even without means of support during the few months of life remaining to them. They naturally leave the trains at the few towns of size and immediately become charges on public or private charity in whole or in part. It is not strange that a vigorous and united protest is forthcoming from that entire region.

The responsibility rests largely, it would seem, on the shoulders of the medical profession of the East and North, which persists in recommending, or, at least permitting, indigent consumptives, even in the last stages of the disease, to leave their homes and die in loneliness and need under the glamour of a justly famed climate. The facts might well be included in the program of public health education which is now engaging the attention of the country.

THE ROLE OF THE SCHOOL IN THE SPREAD OF SCARLET FEVER

A LESSON FROM ONE SCHOOL IN PHILADELPHIA

WALTER W. ROACH, M. D.,
Supervisor Medical Inspection Fifth District

The theorem is quoted from an undoubted authority— the Commissioner of Health of Chicago, and is as follows:—

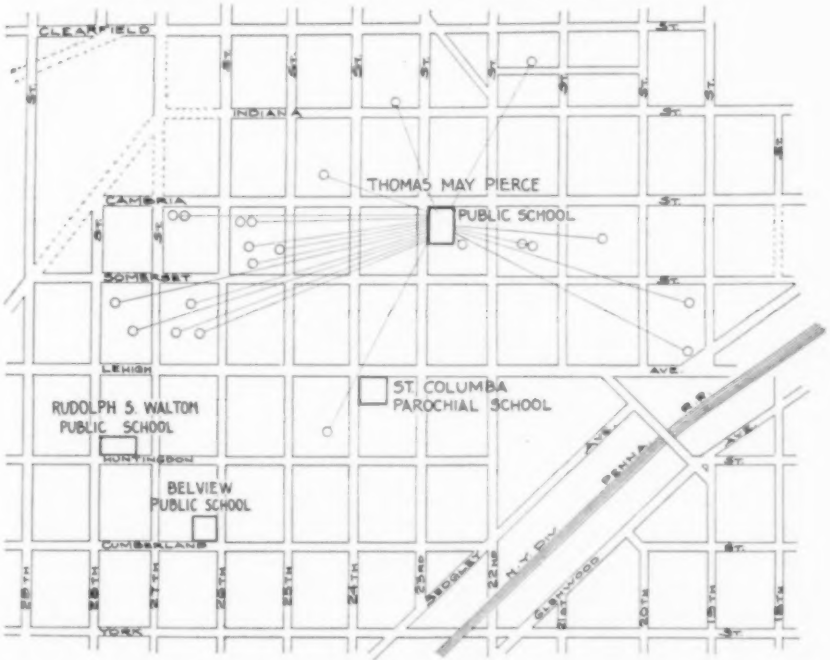
"Unless properly safeguarded by class-room inspection schools are excellent spreading places for infection. The number of cases of infectious diseases always decrease when the schools close for the summer. A part of this dropping off is due to the warm weather. The number of children who get together on the streets constitute a smaller unit than the school unit. The contact within the street unit is not as close as it is in the school unit; therefore the school is a means of spreading contagion. At the same time the school-room is the only place available for the inspection of school children. When this inspection is close enough to watch contacts efficiently, then the schools become centers for clearing contagion and not for spreading it. Consequently the proper policy in an epidemic is not to close a school permanently, but to make the inspection closer and more thorough.

These points were clearly illustrated by conditions at the T. M. Pierce Public School, 23d and Cambria streets, Philadelphia, where the first child was reported with scarlet fever the last of January. Then followed six cases during February. There was no class-room inspection during this time, the school doctor under the rule calling each morning at the Principal's office to examine children referred to him by the teachers, who in the last analysis were the only medical (?) inspectors in the class-rooms, with the whole system depending upon their ability to primarily detect disease.

The "carriers" were undoubtedly in the school, hidden and unrecognized. Twelve more cases followed in March and well on into the month, when the medical man began class-room inspections he picked up seven cases in the school *desquamating*. The following chart shows the location of the homes of these Pierce School children, some coming from far east of the school-house, others from north of it and others from far west of it and nearer to two other schools where no cases occurred. If it had been a neighborhood epidemic other cases would unquestionably have occurred among pupils attending the Walton and Belview schools, but the cases point to one focus and here attention was directed. The Pierce School building was fumigated; inspectors were stationed at each entrance and the fourteen hundred pupils carefully examined. Suspicious ones were refused admission and investigated, while the others were

allowed to enter and continue studies. The absentee records were scrutinized carefully and the homes of such children visited by nurses to learn whether or not sickness was the cause, and if so, what disease. The whole situation was cleared up in a short time.

DIAGRAM MAP SHOWING SPREAD OF SCARLET FEVER



Small circles locate homes of Scarlet Fever patients, lines of contact leading direct to Pierce School as focus; no other cases among families or pupils attending other Public or Parochial Schools in this territory.

MALARIA CONTROL IN CALIFORNIA

HAROLD FARNSWORTH GRAY,
Berkeley, Cal.

Malaria in California is confined to certain fairly well-defined regions, chiefly the Sacramento-San Joaquin valley and the adjacent foothills. There is but little doubt that the agricultural development of this vast area has been, and still is, greatly retarded by the prevalence of the disease. Certain districts are notoriously malarial, and property is in some instances depreciated at least 50 per cent. Compared with the malaria death rate of 4.8 per 100,000 population given by the 1910 census as the average for the entire registration area in the United States, certain districts show extremely high malaria death rates, as for example the Shasta-Tehama-Butte county area, for which the California State Board of Health statistics give a death rate of 46.8 per 100,000, and the Placer-Sacramento-San Joaquin county area, with a rate of 20.4 per 100,000.

On the basis of the death rate from malaria, Dr. William F. Snow, Secretary of the California State Board of Health, has conservatively estimated that the state sustains an annual economic loss of $2,820,000, of which 80 per cent., or $2,256,000, is preventable. Yet this fact has been largely viewed with apathy, indifference, or derision. If this loss were sustained by the live stock of the state, it is safe to say that ample funds would be supplied by both the state and the federal government to control the disease, and the public would clamor for its extermination.

In a few isolated instances, however, some anti-malaria work has been done with a fair amount of success. Its inception occurred as a result of the lectures of William B. Herms, Assistant Professor of Entomology in the University of California, during the runs of the Agricultural and Horticultural Demonstration Train. This train has seven cars of exhibits, one-half of one car being given to rural health problems. During the first two seasons of the operation of this train no interest in malaria control was manifested, but in 1910 considerable work was done. As each campaign was a separate effort, in widely separated districts, they will be considered briefly and individually.

The first work was commenced in March, 1910, at Penryn, Placer County, the center of a large deciduous fruit region, and notoriously malarial. It had been preceded by lectures on malaria, given at the request of the citizens by Professor Herms, in the adjacent towns of Auburn, Newcastle, Penryn, Loomis and Roseville, Penryn being the only town to effect an organization and raise funds. Professor Herms superintended the field operations and placed certain of his university students in charge

of the field work. The field men were paid at the rate of $75 per month, but in only three months did they devote full time to the work, a total of 180 working days being put in, though the operations extended over a period of six months.

With the slender funds available but little drainage work was done, and the use of oil was chiefly relied on to destroy the mosquitoes. No quinine prophylaxis was attempted. The campaign continued from March to November, considerable educational work being done in the last two months. The results obtained can be seen from the school attendance reports, which show a reduction of 46 per cent. in the number of absences from malaria as compared with the previous year. The area covered was about six square miles, and the cost of the campaign was $715.75, divided about as follows:

Equipment	$30.83
Materials (Oil, freight, etc.)*	39.47
Field Agents (Salary and expenses)	498.40
Expert's Expenses (Herms)	129.15
Incidentals	17.90
Total†	$715.75

In 1911 it was intended to carry on the anti-malaria campaign in Penryn, but operations were not begun pending the action of the state legislature in regard to a bill providing for the formation of special anti-mosquito districts, by the operation of which money could be raised by taxation for the conduct of anti-malarial measures. Unfortunately, this bill was badly constructed and, though passed by the Legislature, was properly vetoed by the Governor. Upon the failure of this bill, it was found impossible to raise the necessary money for the campaign (one man gave half of the money in 1910, but demanded that this year every one pay his proper share), and so no work was done. Efforts to raise money for this year have failed so far, though undoubtedly a majority of the residents are in favor of carrying on the campaign.

The second campaign was commenced in Orovillle, Butte County, the field work beginning the last of March, 1910. A local organization, the "Oroville Anti-Mosquito League," raised the money needed by various methods. The campaign was supervised by Professor Herms, and the records of the dredger companies showed from 50 to 75 per cent. less absences from work on account of malaria, as compared with former years. Unfortunately, no records of the cost of the work were kept, but I believe that the sum expended was about $800. One man was employed to perform the field work at a salary of $75 per month.

* Approximately 360 gallons of 32 degrees Baumé, treated stove oil used.

† Does not include cost of horse and rig, which was donated.

Oroville continued the campaign in 1911, but devoted part of its energies to the reduction of the numbers of houseflies, with a resulting improvment in the sanitary condition of the town, and a further apparent reduction in the prevalence of malaria. No actual statistics were available, as in the previous year. Cost records were kept up to the first of August, when the trained man in charge of the field operations was replaced by a laborer. This was necessitated by the lack of funds. The cost of continuous work from April first to August first was as follows:

Field Agent	$500.00
Materials (Oil, Freight, etc.)*	58.95
Rig Hire	48.00
Incidentals	26.60
Total	$633.55

One of the results of the 1911 campaign was the installation of an efficient Board of Health, and the passage of new public health ordinances. The campaign is now in progress for the season of 1912, under the direction of this new Board of Health, a local man with no training in entomology doing the field work. The monthly salary of this man ($75) is paid by the trustees from the general fund, and the health officer has given his salary ($30) for the purchase of oil and other expenses. A committee of five women is assisting in locating mosquito breeding places.

The city of Bakersfield commenced an anti-mosquito and anti-fly campaign in August, 1910, $1,000 being raised for the purpose by the anti-mosquito committee of the Woman's Club of that city. This campaign was continued until June, 1911, when it stopped for lack of further funds. The general sanitary conditions were materially improved, but we have no statistics on the subject and no cost data. Mosquito control is a difficult matter in Bakersfield, as it is surrounded by marshes, and the prevailing winds carry thousands of Culicines into the city every day of the breeding season. The Anophelines were very greatly reduced.

In September, 1911, a request was received by Professor Herms from the Los Molinos Land Company, owning 10,000 acres of irrigated land in Tehama County, to assist in controlling malaria on this project. The writer made a preliminary report on the subject in that month, and anti-malaria work is now proceeding under his direction. During the winter the irrigation system has been revised, enlarged and improved, and drainage provided. At present two laborers are constantly at work on drainage and oiling. Money for the prosecution of the campaign is being liberally provided by the company, and with sufficient funds assured the success of the work is certain. The campaign is being carried on systematically.

* Approximately 360 gallons of treated stove oil (32 degrees Baumé), and 160 gallons water white kerosene.

All cases of malaria are reported and investigated, card indexes are used, and all breeding places are mapped and recorded as to treatment. Accurate cost records will be kept and educational publicity will be undertaken by the local press.

At present there are several communities that are attempting to organize campaigns and raise money for their prosecution, but it is too soon to make any statement in regard to them. Three main propositions are now under consideration, viz.: amending the state "Sanitary Districts Act" at the next session of the Legislature, so that its provisions may be used for the formation of districts for the control of malaria, and the raising of money for the purpose by local taxation; the obtaining of a state appropriation for a comprehensive campaign over the whole malarial area; the obtaining of aid from the federal government for a detailed study of the problem the results of this study to be used as a basis for extended operations when funds are available.

In the meantime, constant publicity is being kept up in the newspapers of the state, and the people are hammered hard on the subject every winter by the lecturers of the rural health exhibit on the "Demonstration Train." Progress is disappointingly slow, but none the less sure.

In all the campaigns carried on so far, with the exception of the Los Molinos project, which has not progressed far enough as yet to show results, the money available has been pitifully inadequate for the purpose. As the campaigns have been inaugurated by committees of citizens, no legal authority or dignity has been given to the movement, and even the laws have been found to be ineffective. As a result of having so little money to work with, but very little permanent improvement has been made, compared with what is possible. Mosquito control has been the system of prophylaxis, this control being based on the oiling of breeding places. No quinine prophylaxis has been attempted, both on account of lack of funds, and because of the American citizen's belief in his inherent right to poison himself and his family with patent remedies if he wants to. And yet, in spite of these difficulties, marked results have been obtained, results which show conclusively that under the management of a trained and experienced person, supplied with sufficient money, and backed by proper laws and legal authority, malaria can be at the very least largely reduced in its prevalence, and in time probably completely exterminated in certain regions of California.

MINUTES OF THE THIRTY-NINTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

HAVANA, CUBA, December 5–9, 1911

The thirty-ninth annual meeting of the Association was called to order in the Ateneo, Havana, Cuba, December 5, 1911. The President, Dr. Robert M. Simpson, in the Chair, and about 100 members present.

The minutes of the preceding meeting having been published in the Journal of the Association, reading was, by unanimous consent, dispensed with.

The Executive Committee reported that the President of the Association, Doctor Simpson, had donated to the Association during the year $250.00, and for the Committee recommended that a vote of thanks be passed in acknowledgment thereof.

Doctor Bryce moved that the recommendation of the Executive Committee be approved and that the Association thank Doctor Simpson for his generous donation. Doctor Bryce's motion, having been duly seconded, was put to vote by the Secretary and was unanimously carried.

The report of the Committee on Membership, duly approved by the Executive Committee, was then presented, recommending for election the following named applicants:

December 5th, 1911.

ACTIVE.

NAME	ADDRESS
Alexander, Andrew B., M.D.	Winnipeg, Manitoba, Canada.
Amoss, Harold L., M. D.	Harvard Medical School, Boston, Mass.
Barham, William B., M. D.	Newsoms, Southampton Co., Va.
Barringer, Paul B., M. D.	Blacksburg, Va.
Bauman, James E.	1737 Oak street, Columbus, Ohio.
Beckwith, Theodore D.	Agri. College, Corvallis, Oregon.
Beitler, Frederic V., M. D.	Ridge avenue, Halethorp, Md.
Benedict, Samuel C., M. D.	127 East Broad street, Athens, Ga.
Botsford, Charles P., M. D.	1337 Main street, Hartford, Conn.
Brown, Lucius P.	898 Church street, Nashville, Tenn.
Bow, D. C.	3119 Minnehaha avenue, Minneapolis, Minn.
Bunker, John W. M.	216 Pleasant street, Newton Center, Mass.
Chester, John N.	Union Bank Bldg., Pittsburg, Pa.
Chew, William H.	Front & Market streets, Camden, N. J.
Darey, J. Herbert, M. D.	Sioux City, Iowa.
De Aragon, Ernesto, M. D.	59 Salud street, Havana, Cuba.

De la Guardia, Vincent, M. D.	19 y D Vedada street, Havana, Cuba.
Diggett, Ernest W., M. D.	Tallahassee, Florida.
Dyer, Elbridge G.	119 College street, New Haven, Conn.
Eaton, John M., M. D.	Virgen, Manitoba, Canada.
Elwood, Everett S.	105 East 22nd street, New York, N. Y.
Escato, Federico, M. D.	113 Independence street, Mantanzas, Cuba.
Fernandez, Juan Santos, M. D.	105 Prado, Havana, Cuba.
Ferrell, John A., M. D.	Raleigh, N. C.
Furbush, C. Lincoln, M. D.	1501 Spruce street, Philadelphia, Pa.
Folks, Homer,	428 Hawthorne avenue, Yonkers, N. Y.
Folsom, William C.	2523 Essex place, Cincinnati, Ohio.
Force, John Nivison, M. D.	2952 College avenue, Berkeley, Calif.
Fort, Arthur G., M. D.	97 Lawton street, Atlanta, Ga.
Gray, Harold F.	2540 Benvenue avenue, Berkeley, Calif.
Halsey, William H., M. D.	The Benedick, Washington, D. C.
Hastings, Charles J., M. D.	2521 Russell Hill Drive, Toronto, Canada.
Hayne, James Adams, M. D.	Le Conte College, Columbia, S. C.
Hernandez, Eusebio, M. D.	Carlos III 22, Havana, Cuba.
Houghton, Elijah M., M. D.	130 Longfellow avenue, Detroit, Mich.
Hudson, Carlos C., M. D.	6 East Franklin street, Richmond, Va.
Hunt, Charles J., M. D.	State Dept. of Health, Harrisburg, Pa.
Latta, Samuel W., M. D.	233 South 4th street, annex, Philadelphia, Pa.
Lebredo, Mario, M. D.	San Jose 99, (altos) Havana, Cuba.
McComb, David E., C. E.	Hotel Florida, Havana, Cuba.
McKay, William G.	325 East Forsythe street, Jacksonville, Fla.
McMillan, Marion B., M. D.	411 West 57th street, New York, N. Y.
MacKnight, Adam S., M. D.	355 North Main street, Fall River, Mass.
Martinez, Emilio, M. D.	Neptuno, 56, Havana, Cuba.
Matson, Eugene G., M. D.	431 Sixth avenue, Pittsburgh, Pa.
Melia, Thomas W.	Flatbush avenue and Eastern Parkway, Brooklyn, N.Y.
Mullin, Robert H.	827 University avenue, southeast, Minneapolis, Minn.
Messer, Richard, C. E.	1110 Capital street, Richmond, Va.
Nelson, Robert, M. D.	1203 Empire Building, Birmingham, Ala.
Nichols, Nelson E., M. D.	657 Congress street, Portland, Me.
O'Brien, John, Jr.	104 East Front street, Plainfield, N. J.
Pazos, Jose Francisco, M. D.	71 Apodaca street, Havana, Cuba.
Porter, Sidney D., M. D.	La. State Board of Health, New Orleans, La.
Pottenger, Francis M., M. D.	Monrovia, California.
Ramos, Domingo, M. D.	234 Neptuno, Havana, Cuba.
Read, Clark Potter	111 Broadway, New York, N. Y.
Rucker, James B., Jr., M. D.	Lansdowne, Pa.
Sayle, Robert G., M. D.	129 16th street, Milwaukee, Wis.
Schench, Powhatan S., M. D.	17 Raleigh street, Norfolk, Va.
Thomson, John T.	5427 Kingsessing avenue, Philadelphia, Pa.
Villuenda, Florencio, M. D.	55, Lagueruda, Havana, Cuba.
Werner, Ray Cowles	528 West Peachtree street, Atlanta, Ga.
Weston, Edmund Brownell, C. E.	P. O. Box, 1316, Providence, R. I.
Wheeler, William, C. E.	14 Beacon street, Boston, Mass.
Wheatley, Louis F., M. D.	53 1-2 West Main street, Meriden, Conn.
Wolff, Arthur J., M. D.	320 Collins street, Hartford, Conn.
Woody, Samuel S., M. D.	2nd and Luzerne streets, Philadelphia, Pa.

ASSOCIATE.

Adams, Frank	Jacksonville, Fla.
Baker, John D.	Jacksonville, Fla.
Brooks, Vernon, M. D.	405 Court street, Portsmouth, Va.
Decker, Asbury C.	2114 First avenue, Birmingham, Ala.
DePree, James	Holland, Mich.
Fox, Hugh F.	508 Central avenue, Plainfield, N. J.
Haas, William P.	152 State street, Hartford, Conn.
Hasker, Everett L.	3018 east Broad street, Richmond, Va.
Hilliard, Curtis M.	87 Middle street, Braintree, Mass.
Palmer, George T.	211 Newbury street, Boston, Mass.
Pomeroy, Carl T.	104 East Front street, Plainfield, N. J.
Potter, Burton D.	2038 State street, New Haven, Conn.
Round, Lester A.	41 Park street, Providence, R. I.
Merrill, Alexander R.	Jacksonville, Fla.
Smith, George H.	107 George street, Providence, R. I.
Speaks, Charles E.	Marietta, Pa.
Sundberg, John Christian, M. D.	6 Aldwell Block, Port Angeles, Wash.
Thompson, Charles T.	11 Livingston avenue, New Brunswick, N. J.
Underhill, Elizabeth C., M. D.	Mount Holyoke College, South Hadley, Mass.

Doctor Guion moved that the Secretary cast the ballot of the Association for the applicants named above. Carried unanimously. The Secretary having cast the ballot in accordance with the instructions of the Association, these applicants were declared duly elected.

The Secretary then read his report, as follows:

REPORT OF THE SECRETARY.

It has not been customary for the Secretary to submit at the annual meetings of the Association anything in the way of a formal report of the operations of his office during the preceding year. The Secretary, however, is brought so closely into touch with all of the work of the organization that it might not be inadvisable to require of him some such account of his stewardship.

The Association does not occupy the place it should in public affairs and public esteem in the several nations that it represents. Had it kept fully abreast of the tides of sanitary affairs, there would today have been no National Association for the Study and Prevention of Tuberculosis, no Association for the Study and Prevention of Infant Mortality, no society for Social and Moral Prophylaxis, no Association for the Prevention of Blindness, each working independently of the others and of this Association; but each of the organizations named and others, if they existed at all, would exist as bodies whose work was definitely correlated to the general sanitary work of the American Public Health Association and definitely correlated through the Association with the work of one another, possibly as sections of the Association. And how much more economical and efficient such an arrangement would be is too manifest to require comment.

Opinion will doubtless differ as to the real causes for the failure of the American Public Health Association to meet the needs of the community as they arose with respect to advances in sanitation. To my mind, however, the default has been due in part at least to the fact that the members of the Association have been too busy talking health and sanitation to give a proper amount of attention to the matter of securing for the Association efficient, energetic

management according to modern business methods. And one of the most potent defects in the existing scheme of organization lies in the fact that as a more or less efficient machine, the Association exists for but a few days each year. The rest of the twelve months it is a mere paper organization, so to speak.

Under the constitution and by-laws of the Association as they now exist, and as they have always existed so far as I know, it is and has been impossible to elect a member except during the annual meeting. For a period of from four to six consecutive days each year applications for membership can be acted upon; during the remainder of the year they can not. The result is that before each annual meeting there is a more or less active campaign for new members, and that as soon as the convention is over nothing is or can be done for another twelve months. Money spent before a meeting for the purpose of interesting persons throughout the several countries represented in the Association in the activity of the American Public Health Association is lost, because if such possible members fail to file their applications at that particular meeting their interest usually wanes before the next.

Objection has been made that the election of a new member is a matter of so much importance that nothing less than the entire organization could safely be entrusted to consider and act upon it. Those who are familiar with the actual working of present practice know that an application for membership is submitted to the Committee on Membership in a hurried meeting along with many other applications, when there is absolutely no fair opportunity to inquire into the qualifications of the applicant. If it is pushed along through the Committee on Membership, it is next acted on in a perfunctory way by the Executive Committee, and it then comes before the Association and is acted upon even more perfunctorily. No applicant recommended by the Committee on Membership ever fails of election. If, on the other hand, election could be made by the Committee of Seven during the intervals between meetings, then there would be ample time to consider carefully the qualifications of any applicant, and the Committee could act intelligently with respect to his application.

But if it has been made difficult to get into the Association, there has been no obstacle placed in the way of anyone getting out. Upon a receipt of a resignation from a member, it has been customary unceremoniously to drop his name from the rolls without action by the Association or even by a committee. The same course has been followed with respect to delinquent members. The importance of keeping a member in after he has shown sufficient interest to enter had apparently never been realized. Certainly, it seems to me, under the present constitution and by-laws no officer and no committee of the Association has any authority to drop the name of any member from the rolls, but the Association itself should act. In the meantime, too, pending action by the Association, an earnest effort should be made to induce the member whose resignation has been handed in or who has failed to pay his dues to take whatever action may be necessary to renew his membership.

It is important that the Association determine just what it desires to be. The present constitution, adopted at Winnipeg, August 26, 1908, seems to have been adopted with the idea of strengthening the technical character of the Association. The constitution in force prior to that time provided that the active members should constitute the permanent body of the Association and should be selected with special reference to their acknowledged interest in or devotion to sanitary studies and allied science and the practical application of the same. The terms of the constitution were sufficiently broad to allow the Committee on Membership, the Executive Committee, and the Association great latitude in determining who might and who might not be elected to active membership. The Winnipeg constitution, however, provides that active membership may be accorded only to those who have been for a period of three years in the active professional practice of technical branches of public hygiene, or have been for a period of three years on the executive or technical staffs of governmental departments dealing with phases of public hygiene in the countries represented in the Association; to associate members, who have qualified under certain specified provisions; to foreign members

recommended by the Advisory Council; and to delegate members under certain specified restrictions. Already difficulty has been experienced under this constitution, and thoroughly desirable sanitarians have hesitated about applying for membership because under the constitution they could be ranked merely as associate members. So serious has been this difficulty that an amendment was proposed at the Milwaukee meeting and is now pending, giving to the Executive Committee the right to recommend for active membership persons presenting satisfactory qualifications in lieu of the three years' service specified above.

It may be seriously questioned, however, whether the Association will not grow more in numbers, and whether it can not grow at least as well in power and influence, if the distinction between active and associate members be wiped out and the American Public Health Association frankly acknowledge itself to be the great popular health organization, uniting the four great countires represented in it. Under such an organization, technical work could be done in sections, just as such work is now done in connection with the National Association for the Study and Prevention of Tuberculosis. If, however, on the other hand, the Association desires to stand before the public as a technical organization, analogous to the American Society of Civil Engineers and like organizations, then it must frankly recognize the facts that it can never have any great membership and it must either limit its field of endeavors so as to cover it efficiently with the income received from members or else must frankly look for outside contributions for support. And it may be suggested that outside contributions for health work are hardly as likely to be made to a technical organization as to one operating on a more popular scale.

The working organization of the Association is too loosely made up and too cheaply run to be effective. And yet the organization is most extravagant. The Association undertakes to maintain three offices in three different parts of the country. The Secretary's office is in one part of the country, the Treasurer's in another, and the office of the Managing Editor in a third. If these or any one of them were mere honorary offices there might be no serious objection to the plan. But they are not; each is an actual working office. The result is duplication of effort and waste of money and energy. The Secretary has a mailing list, the Treasurer a mailing list, and the Managing Editor a mailing list. Envelopes, wrappers, addressing and postage, are, therefore, triplicated.

No one officer of the Association receives from the Association compensation sufficient to command any considerable part of his time—that is, if his time is worth anything. The Secretary receives an honorarium of four hundred dollars per annum, but pays his own expenses to and from meetings of the Association, and pays for the services of an assistant at the annual meeting if he has one. The Treasurer receives an honorarium of two hundred dollars per annum, and pays his own expenses to and from the meeting. The Managing Editor receives a salary of two hundred dollars per annum, and has an interest in the profits of the Journal, which profits, however, are not yet in sight.

The status of the Manager of the Journal is somewhat different from that of the Secretary and Treasurer, because in theory at least he has opportunity to increase his income up to any reasonable point by making the Journal a financial success, although it must be admitted that the opportunity of doing so appears at the present time to be remote. With respect to the Secretary and Treasurer, however, anyone of four conditions may exist. A Secretary or Treasurer may be found who is sufficiently wealthy to justify him in paying out of his own funds for the services of a clerk or clerks sufficiently competent to relieve him not only of the routine clerical work of the office but also of the supervisory work. Or, a member may be found willing to accept the secretaryship or the treasurership whose time is of so little value that he can afford personally to look after the work of the office. Or, in the third place, a member may be found, conceivably, who could in some way use the secretaryship or the treasurership to further private ends, so that the honorarium from the Association would be of minor importance.

Or, in the fourth place, a competent secretary or a competent treasurer may be found who, at a considerable personal sacrifice, will conduct the work of the office.

The fourth contingency is the only one that is like to happen. It is certain, however, that no matter how willing a member of the organization may be to work for the Association at a personal sacrifice for a time, he can not continue it indefinitely, and frequent changes in either of the offices named are detrimental to good management. Neither would it appear that there is any justification for asking any one member to work for the Association at any great personal loss of time and energy. No such demand would be made upon any one with respect to money, and there is no more reason why it should be made with respect to time and energy. When one gives to the Association his time and his service that if directed in some other channel might bring in a substantial money return, he is contributing cash to the Association out of his own pocket just as much as if he earned the cash and turned it over to the Association. If the members of the Association desire fairly to distribute the burden of its work, they must provide for the adequate remuneration of the secretary and treasurer, to keep them more or less permanently in office. In order to do this, too, the Association must select and maintain headquarters in some given locality, so as to identify itself with that particular place.

It may be said that the Association is not financially able to carry into effect the arrangement suggested. In my judgment it is not likely that the Association will be able to do so so long as it continues to look around for endowment funds and contributions of considerable size and ignores smaller amounts. There are certainly but few members in the Association who could afford to contribute in cash to the Association in any one year, $1,000, $500, $100, or possbily even $50.00. It is not at all unlikely, however, that many could be found who would give one or two dollars a month, or a quarter, or possibly every six months. And the sum total of the amounts thus contributed would in the end be ample for the support of the organization. At least one organization, one not directed to the promotion of public health or to the promotion of any good end, obtains its funds to a certain extent in the manner suggested, and it seems always to have ample funds for its purposes. That, however, is no reason why the Association should not adopt the same plan for the raising of funds for good purposes.

A change should be made with respect to the control of the expenditures of the Association. As the Auditor who examined the accounts of the Managing Editor reported, it is impossible to make any satisfactory financial statement of the condition of the Association so long as some accounts are kept in one part of the country and some in another. Difficulty arises, moreover, in complying with the requirements of the constitution which provides that all appropriations for usual current expenses shall be made by the Committee of Seven. In practice this provision of the constitution is regularly ignored, the Chairman of the Committee of Seven and the Secretary acting for the committee without consulting the entire membership. To consult the entire membership would involve a very considerable delay in the payment of bills, to the embarrassment of those who contract them and to the annoyance of many petty creditors.

The Committee of Seven, or some similar body, should be given wide discretion to act with respect to public health movements. It is not at all inconceivable that in the period that elapses between annual conventions questions of importance may arise concerning which action might logically be taken by the American Public Health Association, in the interest not only of the public but of the Association. If, for instance, when any important public health movement is underway, such as that that led to the organization of the American Association for the Study and Prevention of Infant Mortality, and other similar movements, the Committee of Seven were authorized definitely and positively to speak for the Association and to undertake to handle and direct such a movement, the coördination of public health agencies in the future would be assured. As it is now, the most that can be done is for the officers of the Association to sit by and watch the movement culminate in the organization of some new congress or association, tending thus to withdraw the interest and support of the American

Public Health Association and necessitating the organization of new machinery on the part of the promoters of the new movement when the machinery already established by the American Public Health Association should be ample. As has been pointed out before, the Association should exist in fact as well as in part at all times.

It would seem that some definite provision should be made with respect to members of the Association who speak Spanish only. This year, application blanks have been printed in Spanish, as have also circulars of information relative to the Association, and memoranda relative to the preparation of papers. The Journal of the Association is published, however, only in English, and the proceedings are not available to a very considerable number of members residing in Mexico and Cuba. The Secretary has no suggestions to offer with respect to this matter, but calls it to the attention of the Association for its consideration and with the hope that some means may be devised whereby the papers and reports of the Association may be available to all members.

The Association should endeavor to be of larger service to its members, and it cannot be of such service without funds. During the past year the Secretary has been requested to furnish information to one city relative to the control of water supplies. Another has asked for information relative to school hygiene, a third has asked for health literature generally, one of the great organizations of the country has asked for a bibliography of works relating to sanitation, and other similar requests have been received. These requests show the position that the writers have thought the American Public Health Association occupied, and they show the position which the Association should occupy. Funds should be available for the compilation of data of this kind for interested inquirers, and the very fact of being able to compile such data and to furnish it promptly would be an inspiration to those outside of the organization to become members.

I have presented these somewhat discursive remarks, put together as best I could in a very limited time, so that those who are not so closely in touch with the affairs of the Association as is the Secretary, may know something of the true condition of the organization, and with the expectation that they will take action to correct conditions retarding its growth or else themselves assume responsibility for them and for the failure of the Association to fill its proper place in the life of the people of the several countries which it undertakes to serve.

WM. C. WOODWARD,
Secretary.

December 5th, 1911.

Doctor Holton moved that the report of the Secretary be referred to the Executive Committee. Carried.

On behalf of the Executive Committee, the Secretary then submitted the report of the Treasurer, duly audited and approved by the Committee of Seven, as follows:

FRANK W. WRIGHT, *Treasurer.*

In Account with the American Public Health Association.

Dr.						*Cr.*
1910			1910		Order No.	
Sept. 15.	Bal. in general account	$991.54	Sept. 15.	W. R. Stokes	357	80.80
	Bal. in savings bank	2622.40	15.	Am. Jour. Pub. Hy.	358	656.00
	Interest to July 1, 1911	105.92	15.	Judd & Detweiler	359	4.50
	Sale of Transactions	602.59	15.	Crane Printing Co.	360	43.60
	Back dues	190.00	15.	Letter Shop	361	5.90
	Dues for 1910	2960.00	15.	W. C. Woodward	362	107.39
	Advance dues	225.00	15.	W. C. Woodward	363	400.00

Dr.							*Cr.*
1910				1910		Order No.	
Sept. 15.	Dr. R. M. Simpson..	$250.00		Sept. 15.	Spahr & Glenn....	364	$42.50
	Subscriptions.....	697.40		28.	James O. Jordan...	365	4.55
				Nov. 15.	W. C. Woodward..	366	203.94
	Carried forward....	$8644.85		15.	Welling, Paret & Co	367	16.90
				15.	F. J. Heer Prt'g Co.	368	3.60
				15.	B. R. Rickards....	369	10.00
				15.	W. C. Woodward..	370	25.50
				15.	Crane Printing Co.	371	5.50
				15.	Judd & Detweiler..	372	5.00
				15.	Letter Shop.....	373	5.65
				15.	W. C. Woodward..	374	36.13
				1911			
				Jan. 1.	Wm. Whitford....	375	163.56
				3.	Crane Printing Co.	376	5.00
				3.	Letter Shop.....	377	2.85
				3.	U. S. Express Co...	378	2.50
				3.	Wells, Fargo & Co.	379	0.50
				3.	Adams Express Co.	380	0.76
				3.	American Exp. Co.	381	0.20
				3.	C. G. Stott & Co...	382	1.75
				Feb. 3.	Lanman Engraving Co.....	383	2.00
				21.	Judd & Detweiler..	384	3.75
				24.	Wells, Fargo & Co.	385	0.75
				24.	J. A. Hauff.....	386	15.00
				24.	B. R. Rickards....	387	145.32
				24.	E. H. Sells & Co...	388	4.70
				Mar. 10.	W. C. Woodward..	389	79.24
				29.	W. C. Woodward..	390	33.20
				16.	F. W. Wright.....	391	37.10
				16.	A. J. Slack.....	392	25.50
				29.	Spahr & Glenn....	393	14.50
				29.	Spahr & Glenn....	394	246.75
				Mar. 5.	B. of H. Manchester	395	2.00
				29.	W. C. Woodward..	396	27.01
				May 1.	B. R. Rickards....	398	202.00
				22.	T. Powell.....	399	5.00
				June 12.	B. R. Rickards....	400	106.49
				12.	H. W. Hill.....	401	38.09
				20.	C. G. Stott & Co...	402	2.05
				20.	Spahr & Glenn....	403	588.30
				20.	W. C. Woodward..	404	78.54
				July 7.	W. C. Woodward..	405	57.55
				7.	R. M. Simpson....	406	75.00
				7.	E. C. Levy.....	407	59.40
				Aug. 11.	B. R. Rickards....	408	263.08
				11.	H. W. Hill.....	409	15.55
				11.	H. W. Hill.....	410	3.57
				Sept. 1.	Letter Shop.....	411	2.80

Dr.			*Cr.*
1910		Order No.	
Sept. 15.	Crane Printing Co.	412	$143.44
27.	W. C. Woodward. .	413	48.50
Oct. 19.	C. G. Stott & Co. . .	414	2.05
19.	B. R. Rickards. . . .	415	230.29
19.	W. C. Woodward. .	416	39.38
19.	Crane Printing Co.	417	8.75
24.	B. R. Rickards. . . .	418	107.63
23.	F. W. Wright.	419	213.35
Nov. 10.	The Letter Shop. . .	420	5.00
10.	Crane Printing Co.	421	44.50
11.	Spahr & Glenn. . . .	422	21.00
14.	W. C. Woodward. .	423	71.28
	Total.		$4823.99
	Cash in savings bank. . .		2728.32
	Cash on hand.		1092.54
			$8644.85

Audited and found correct:
December 4, 1911.
W. R. Batt,
Gardner T. Swarts,
Audit Committee.

Doctor Guion moved that the Treasurer's report be accepted and placed on file. Carried.

Resignations were received from the following members of the Association:

Eugene L. Hollister, Joseph Raymond, Herbert W. Williams, Francis H. Bennett, Kenneth Bradford, R. G. Broderick, Wm. Francis Drewry, M. S. Evans, Alfred P. Hanchett, Milton H. Hershey, Edgar H. Lancaster, Bernard A. Parsons, R. A. Pearson, Herbert E. Smith, Byron Stanton, Chas. F. Whiting, Thomas Wilson, John W. Ross, W. J. Lumsden.

Doctor Bell, of Toronto, moved that these resignations be accepted. Carried.

Papers were then read as follows:

1. Annual Report on Yellow Fever in the Republic of Mexico, by Dr. Eduardo Liceaga, President, Superior Board of Health, Mexico.

2. False Alarm of Yellow Fever in Banes, Cuba, in connection with the Cuban Sanitary Organization, by Dr. Juan Guiteras, Director of Public Health, Cuba.

The papers named above were discussed by Drs. Gardia, Lebredo, Anderson, Guiteras, and Mendizabel.

3. Tropical Diseases, in Cuba by Dr. Enrique B. Barnet, Chief Editor, Department of Sanitation and Charities, Cuba.

Discussed by Dr. Escoto.

4. Typhoid Fever in Havana, by Dr. Jose A. L. del Valle, Chief Health Officer, Havana, Cuba.

5. Studies in Rural Typhoid Fever in Virginia, by Dr. Allen W. Freeman, Assistant Commissioner of Health, State of Virginia, and Dr. Leslie L. Lumsden, United States Public Health and Marine Hospital Service.

6. Report of Typhoid Fever in Richmond, Virginia, during 1909–10–11, by Dr. Ernest C. Levy, Chief Health Officer, Richmond, Virginia.

7. The Use of Antityphoid Vaccine in Public Institutions in Maryland, by Dr. Frank W. Hachtel and Dr. Harry W. Stoner, Baltimore, Maryland.

8. Report of Committee on Reporting Typhoid Fever, by Dr. Hibbert W. Hill, Chairman, Minneapolis, Minnesota.

Dr. Fulton moved that the report of the Committee on Reporting Typhoid Fever be accepted, and the Committee discharged. Carried.

The foregoing papers on typhoid fever were then discussed by Drs. Hayne, Douglas, Tuttle, Guiteras, Dowling, Guilfoy, Boyd, and Porter, of Louisiana.

9. The Treatment of Baltimore Drinking Water by Calcium Hypochlorite, by Dr. William Royal Stokes, and Dr. Frank W. Hachtel, Baltimore, Maryland.

Discussed by Drs. Bryce, Perkins, Wood, and Brooks.

10. Child Hygiene, by Prof. E. Hernandez and Dr. D. F. Ramos of Havana, Cuba. Discussed by Drs. Snow, Simpson, and Dresslar.

On motion of Dr. Rankin, the meeting then adjourned.

ROBERT M. SIMPSON,
President.
WM. C. WOODWARD,
Secretary.

Second Day.

HAVANA, CUBA,
December 6, 1911.

The meeting was called to order in the Ateneo, at half past nine o'clock, a.m., by the President.

By unanimous consent the reading of the minutes of the preceding meeting was dispensed with.

The Executive Committee submitted the reports of the Committee of Seven, as follows, with a recommendation that it be adopted:

REPORT OF COMMITTEE OF SEVEN.

TO THE EXECUTIVE COMMITTEE:

In compliance with Article V, Section 4, of the Constitution, the Committee of Seven respectfully submits the following report:

On October 6, 1910, the Committee unanimously elected as Chairman

Dr. Robert M. Simpson, President of the Association and *ex officio* a member of the Committtee.

On October 10, 1910, Dr. John N. Hurty, appointed by the Executive Committee a member of the Committee on Journal, having declined to serve as a member of that committee because of the condition of his health, Dr. Ernest C. Levy was appointed by the Committee of Seven to fill the vacancy.

On October 10, 1910, the Executive Committee having adjourned without having fixed the time for the meeting to be held in 1911, the Committee of Seven fixed the time for said meeting, December 4th to 9th inclusive.

October 13, 1910. The Committee of Seven accepted the tender of the services of the following residents of Havana, as the Local Committee on Arrangements, the committee having been organized by the Secretary of Sanitation of Cuba:

LOCAL COMMITTEE ON ARRANGEMENTS.

Dr. M. Varona Suarez, *President.*
Dr. Juan Guiteras, *Vice-President.*
Dr. Federico Torralbas, *Secretary.*

Dr. Jose A. Lopez Del Valle.
Dr. Eugenio Sanchez Agramonte.
Dr. Gabriel Custodio.
Dr. Pedro Sanchez Del Portel.
Dr. Emilio Martinez.
Dr. Enrique B. Barnet.
Dr. Francisco Solis.
Dr. Joaquin L. Jacobson.
Dr. Aristides Agramonte.
Dr. Julio Arteaga.
Dr. Carlos Kohly.
Dr. Juan Santos Fernandez.
Dr. Alberte S. De Bustamanto.
Dr. Jose A. Presno.
Dr. Enrique Nunez.
Dr. Bernardo Moas.

October 14, 1910. Dr. Charles A. Hodgetts, who was elected by the Executive Committee to serve as a member of the Committee of Seven, having been found ineligible because of the expiration of his term of service as a member of the Executive Committee, the Committee of Seven appointed Dr. Wilmer R. Batt to fill the vacancy.

November 10, 1910, the American Public Health Association having been invited to affiliate with the National Municipal League, composed of organizations formed to secure the improvement of municipal governments, and of individuals interested along the same lines, the Committee of Seven, on behalf of the Association, determined that such affiliation was inexpedient.

December 3, 1910. The Committee of Seven having by amendment to Chapter 10 of the by-laws made at the Milwaukee meeting been authorized to make such changes in the by-laws as might be required to adapt them to the rules and regulations of the United States Postal authorities,

amended Chapter 7 of the by-laws so as to read as follows, and respectfully submits its action for ratification by the Association:

CHAPTER 7. ANNUAL FEE.

The annual fee in each class, except the honorary, in which there is no fee, shall be three dollars. Any member desiring, however, to receive the papers, reports, and the transactions of the Association printed the official organ of the Association (which, during the remainder of the calendar year 1910, shall be the American Journal of Public Hygiene) shall be entitled to do so upon the payment of a subscription price of two dollars per annum.

No member, of any class, shall be entitled to enrollment at an annual meeting, to a badge of membership, or to the privileges of any class, until his dues are paid to date, except that if arrearages exceed two full years' fees, payment for two past years and the present year shall restore him to full standing.

February 17, 1911. The Committee of Seven ratified the action of the Secretary with respect to the custody of bound volumes and reports, providing:

1. That the volumes then on shelves in the office of the State Board of Health of Ohio be counted and cased.

2. That the cases containing back volumes be opened, the volumes sorted and repacked, moldy or injured volumes to be placed to one side for final disposition.

3. That where over one hundred books of any one volume exist these volumes be packed separately in cases marked "surplus."

4. That all cases be marked or stenciled legibly with a key number or letter and that a record be made of the cases and the number of books of each volume contained in each case, etc.

The above work to be done at a cost of approximately twenty-five dollars, plus the cost of any new cases that might be needed for packing. The Managing Editor was authorized to transport to the new headquarters of the Journal, at the expense of the Association one hundred copies of each volume of papers and reports, and to store the remaining copies in Columbus on the most favorable terms that he might find feasible.

March 25, 1911. The Managing Editor having reported that in sorting and arranging the stock of papers and reports of the Association, 249 copies were found damaged by water and of no value except for old paper, and that of certain volumes 869 individual quarterly numbers were found over and above those necessary to make complete sets, the Committee of Seven authorized their sale as old paper.

March 26, 1911. A meeting of the Committee on Journal, at the expense of the Association, was authorized.

April 6, 1911. The Committee thanked certain members of the Association residing in New York for the efforts such members had made toward procuring financial support for the Journal.

April 10, 1911. The Committee of Seven authorized the sale of the several volumes of papers and reports and of essays at the rates given below and the sale of the entire series of papers and reports in so far as the series was then in the custody of the Association at a flat rate of $65.00, and authorized the Secretary to use his discretion with respect to reductions from said flat rates to be made as the number of available volumes diminishes.

Volume	Price	Volume	Price	Volume	Price
1	$2.50	13	$1.00	25	$1.00
2	1.00	14	1.00	26	1.00
3	....	15	1.00	27	2.50
4	2.50	16	1.00	28	3.50
5	3.50	17	1.00	29	2.50
6	3.50	18	1.00	30	5.00
7	2.50	19	1.00	31	5.00
8	1.00	20	2.50	32	5.00
9	1.00	21	2.50	33	5.00
10	1.00	22	1.00	34	5.00
11	1.00	23	2.50	35	5.00
12	1.00	24	1.00	..	....

April 20, 1911. The Committee ratified a tentative arrangement made by the Managing Editor with Messrs. Spahr and Glenn, of Columbus, Ohio, giving into their custody, without expense to the Association, certain volumes of papers and reports of the Association, which Messrs. Spahr and Glenn agreed to forward to purchasers as authorized by the proper officers of the Association.

September 16, 1911. The Committee authorized the F. P. Kaiser Publishing Company, of St. Louis, Missouri, for purposes of publication, to make representative extracts from papers in the series of copyrighted prize essays published by the Association, proper credit to be given to the author and to the Association.

September 21, 1911. The Committee authorized that arrangements be made for the publication of the papers and reports of the American Public Health Association, presented at the Milwaukee meeting, in a bound volume as heretofore, the issue to consist of 150 copies, to be published at a cost not to exceed thirty cents per page, with binding at a rate of not more than thirty cents per copy.

September 26, 1911. The Committee authorized the translation and printing of the blank form of application for membership in the Association, the circular of information relative to the Association, and a circular on the preparation of papers, in Spanish, so as to facilitate the diffusion of information concerning the Association, in Mexico and Cuba.

December 4, 1911. The Committee of Seven audited the accounts of

the Treasurer and found them correct. These accounts as reported by the Treasurer to the Association show receipts and expenditures during the year, and the cash in hand on November 14, 1911.

ROBERT M. SIMPSON,
President.
WM. C. WOODWARD,
Secretary.

Havana, Cuba, December 5, 1911.

Dr. Guion moved that the Report of the Committee of Seven be adopted, with the proviso, however, that the following words in the amendment to the by-laws adopted by the Committee of Seven, be stricken out: "which during the remainder of the calendar year 1910 shall be the American Journal of Public Hygiene". Carried.

Dr. Guion moved that Chapter 10 of the by-laws be amended by inserting the following words

"The Committee of Seven shall have the power to make such changes, and such changes only, in the by-laws of the Association as may be required to adapt them to the rules and regulations of the United States Postal authorities. Such changes as the Committee of Seven shall make shall be presented to the Association at the next regular meeting for ratification."

The Chairman stated that under the provisions of Chapter 10 of the by-laws, the amendment proposed by Dr. Guion would have to lie over for at least a day, and that in the meantime, without objection, it would be referred to the Executive Committee. There being no objection, it was so referred.

The Exectutive Committee reported that at the 1910 meeting more than ten members of the Association had requested the establishment of a Section on Sanitary Engineering, and that a Committtee had been appointed then to inquire into the feasibility of organizing such a section. In view of the remoteness of the place of meeting, that committee had thought it best not to undertake to organize the section this year. The Executive Committee recommended, however, that the conditional organization of a Section on Sanitary Engineering provided for at the 1910 meeting be made definite and that the Association by formal action establish such a section, requesting those interested in its establishment to proceed as soon as possible to its formal organization.

Dr. Bryce moved that the report of the Executive Committee be adopted. Carried.

The Executive Committee reported that the Sociological Section made no provision for the election of officers at the Havana meeting to serve the ensuing year and recommended that the Association by vote continue

in office those officers of the Sociological Section who were elected at the 1910 meeting, as follows:

Chairman, Mr. John M. Glenn, New York, N. Y.
Vice Chairman, Mr. Lawrence Veiller, New York, N. Y.
Secretary, Mr. Frederick Almy, Buffalo, N. Y.
Recorder, Dr. W. F. Snow, Sacramento, Calif.
Council.
Dr. Peter H. Bryce, Ottawa, Canada.
Dr. George W. Goler, Rochester, N. Y.
Dr. Herbert D. Pease, New York, N. Y.
Dr. Frank F. Wesbrook, Minneapolis, Minn.
Mr. A. M. Wilson, Philadelphia, Pa.

Dr. Snow moved that the report of the Executive Committee be adopted. Carried.

The report of the Committee on Membership, duly approved by the Executive Committee, was submitted, showing that the applicants named below were eligible to election to the classes specified, and recommended such election.

December 6, 1911.

ACTIVE.

NAME	ADDRESS
Ascanio, Ramon, M. D.	Havana, Cuba.
Barnet, Enrique B., M. D.	92 Aguila street, Havana, Cuba.
Browne, William Ward	157 Williams street, Providence, R. I.
Codino, Manuel, M. D.	26 8th street, Havana, Cuba.
Cowan, Cristino F.	30–32 Empedrado street, Havana, Cuba.
Cabrera, Eugenio A., M. D.	Havana, Cuba.
Davis, William H., M. D.	23 Beaumont street, Boston, Mass.
de Fuentes, Alberto S., M. D.	Havana, Cuba.
Dominquez, Alfredo G., M. D.	P. O. Box 1131, Havana, Cuba.
Dominques, Manuel M., M. D.	Havana, Cuba.
Dowling, Oscar, M. D.	New Court House Building, New Orleans, La.
Fernandez, Francisco M., M. D.	Havana, Cuba.
Finley, Carlos E., M. D.	Havana, Cuba.
Hicks, John R., M. D.	Covington, Indiana.
Jordan, German A., M. D.	4161 Lindell Blvd. St. Louis, Mo.
Le Roy, Jorge, M. D.	Havana, Cuba.
Maloney, John B., M. D.	Louise Maloney Hospital, Key West, Fla.
Mendizabal, Gregorio, M. D.	Mexico City, Mexico.
Mohr, Charles A., M. D.	252 St. Anthony street, Mobile, Ala.
Pena, Jose M., M. D.	Havana, Cuba.
Pina, Juan M., del, M. D.	Pinar del Rio, Cuba.
Recio, Alberto, M. D.	Havana, Cuba.
Ross, George F., M. D.	617 West Gaston street, Greensboro, N. C.
Taboudela, Jose A., M. D.	Havana, Cuba.
Turnbull, A. R., M. D.	1 River street, west, Moose Jaw, Sask., Canada
Vergara, Manuel, M. D.	Puebla, Mexico.
Woodworth, Elizabeth A., M. D.	3201 Clinton avenue, Minneapolis, Minn.

ASSOCIATE.

Babcock, Robert P.....State Capitol, Austin, Texas.
Boyd, William A., M. D.....1710 Hampton street, Columbia, S. C.
Figueras, Jose A., Ex. D. D. S.....Havana, Cuba.
Porter, Joseph Y., Jr. M. D.....Key West, Fla.
Smith, Claude A., M. D.....City Hall, Atlanta, Ga.

Dr. Guion moved that the Secretary cast the ballot of the Association for the applicants whose names had been presented by the Committee on Membership. Carried unanimously.

The Secretary having cast the ballot of the Association for the applicants named above, they were declared duly elected.

The Committee on Publication, through the Secretary, *ex officio* Chairman, reported that its work during the year had been uneventful, and that the publication of 6 of the papers read at the 1910 meeting, elsewhere than in the organ of the Association, had been authorized.

The Report of the Committee on Journal was submitted by the Chairman, Dr. Levy, as follows:

December 6, 1911.

The Committee on Journal begs to submit the following reports:

The Executive Committee of the A. P. H. A., at a meeting held in Waukesha, Wis., on September 9, 1910, appointed the following as the Committee on Journal, in pursuance of a resolution adopted by the Association at the Milwaukee Meeting:

Dr. J. N. Hurty,
Dr. H. W. Hill,
Dr. G. T. Swarts,

with Dr. R. M. Simpson, President of the Association, and Dr. Wm. C. Woodward, Secretary of the Association, as members *ex officio*.

The declination of Dr. Hurty to serve as a member of the Committee having been subsequently received, the Committee of Seven appointed Dr. E. C. Levy to fill this vacancy.

The Committee held its first meeting on November 18, 1910, in Buffalo, N. Y., Drs. Swarts, Hill, and Levy being in that city on the invitation of and at the expense of the New York State Board of Health. There were present at this meeting Drs. Swarts, Hill, Woodward, and Levy.

Dr. Woodward announced that, on motion of Dr. Simpson, the Committee of Seven had appointed Dr. Levy Chairman of the Committee on Journal. Dr. Levy stated that he was most unwilling to assume this very important office but that he did so in order that the meeting for which the members were then assembled might be held, there being then no opportunity to obtain another appointment by the Committee of Seven.

The Committee on Journal elected Dr. Woodward Secretary of the Committee.

The terms of office of the three appointed members, not having been designated by the Executive Committee, were determined by lot as follows: Dr. Levy, 1 year; Dr. Hill, 2 years, and Dr. Swarts, 3 years.

The Committee appointed as Managing Editor, Mr. L. R. Rickards, at an annual compensation of $1200.00, and 50% of the net profits accruing to the Journal for advertising, from subscriptions outside of the A. P. H. A., and from the publication of transactions of other Associations.

A second meeting of the Committee on Journal was held May 1, 1911, in Champaign, Illinois, to determine certain important future policies of the Journal. There were present at this meeting Drs. Simpson, Hill, Woodward, and Levy. The Managing Editor, Mr. Rickards, was also present.

Dr. Simpson's contribution of $250.00 to defray the cost of this meeting, has already been gratefully acknowledged by the Association at its present session.

In the month of February, 1911, a group of members interested in the success of the Journal put in motion a plan for securing from members of the Association guarantees for funds for the Journal. This plan was undertaken without consultation with the Committee on Journal, and when later submitted to that Committee, was not endorsed by it.

A meeting of the Committee on Journal was held on December 2, 1911, on the train between Jacksonville and Knight's Key, en route to the present meeting. Present, Drs. Simpson, Swarts, Woodward, and Levy. Dr. Hill signified by letter his inability to be present, as did also the Managing Editor.

The chief business of this meeting was the consideration of the report of Mr. B. E. Bramble, who had been employed by the Committee to audit the accounts of the Managing Editor. This report covered the 10 months ending October 31, 1911, and shows:

Cash received on account of the Journal		
Cash received	$1424.77	
Accounts receivable	518.15	
Subscription of Dr. Simpson	250.00	
Total amount received and receivable		$2192.92
Expenditures and outstanding liabilities on account of the Journal:		
Salary of the Managing Editor		$1,000.00
Printing		2,052.09
Expenses of Urbana meeting		231.04
Incidentals		177.44
Liabilities for unearned payments for subscriptions and advertisements		478.99
Total expenses of Journal		$3,939.56
Less total amount received and receivable		2,192.92
Net cost of running Journal for 10 months		$1,746.64

If it be assumed that the cost of conducting the Journal for the last two months of 1911 will be at the same rate as for the first 10 months, the total cost for the year will be $2,095.97. This represents, in effect, the cost of publishing the papers and transactions of the American Public Health Association.

Respectfully submitted,

E. C. Levy,
Chairman, Committee on Journal.

Wm. C. Woodward, *Secretary.*

Dr. Levy moved that this report be referred to the Executive Committee. Carried.

The Secretary reported that difficulty had been experienced in organizing the Committee on Trust Funds, provided for in one of the amendments to the constitution adopted in 1910, owing to some misunderstanding as to the duties of the committee.

Dr. Bryce moved that this matter be referred to the Executive Committee with the request that it report back to the Association such a resolution, if any, as it deemed necessary. Carried.

The Secretary announced that the meeting of the Advisory Council would be held in the Ateneo, at eight o'clock, p.m., December 7th, and the membership of the Advisory Council was announced.

The amendments to the constitution and by-laws proposed at the 1910 meeting were then taken up for consideration.

Amend the constitution, Article 3, Section 6, by adding "and to such others as the Executive Committee may recommend as presenting satisfactory qualifications in lieu of the three years' service specified above."

Dr. Wright moved that the article of the constitution referred to be amended so as to provide that there shall be but one class of members, active, and that verbal changes be made in the constitution and by-laws wherever necessary to make them conform to Article 3 in its amended form. Duly seconded.

Dr. Freeman raised the point of order that Dr. Wright's motion was not germane to the amendment to the constitution as submitted at the 1910 meeting and as now under consideration, and that it was, therefore, out of order.

The Chair ruled against the point of order.

Dr. Woodward moved that further consideration of this amendment be postponed until the morning session, December 7, and that the Executive Committee be requested to consider the matter carefully before that time and to report to the Association at that meeting its judgment concerning the situation. Carried.

The second pending amendment to Article 3 was then taken up for consideration, said amendment being as follows:

Add to Article 3, to be known as Section 8, as follows: and make such verbal changes in the constitution and by-laws as may be necessary to conform therewith:

"Section 8. Any federal, state, or municipal department, bureau, or service, and any association or other organization, in any of the countries represented in this Association, engaged in the conservation and promotion of public health, may, upon application, be elected to membership in the same manner as any person, and shall thereupon have all rights, privileges, and obligations of other members, and shall be entitled to participate in all proceedings of the Association through a delegate duly authorized in writing for that purpose. Duly appointed delegates from such departments, bureaus, services, association, or other bodies may present papers approved by the Program Committee of this Association and engage in the discussion of papers read at its regular meetings, and members of such departments, bureaus, services, associations, or other bodies may receive the publications of this Association upon such terms as may be agreed upon by its Publication Committee."

Dr. Freeman moved that this amendment be adopted. Carried unanimously.

The pending amendment to Chapter 5 of the by-laws, as follows, was then taken up for consideration.

Amend the by-laws, Chapter 5, by adding after "present" the following:

"Provided, however, that during the interval between any two meetings of the Association any applicant whose application has been reported favorably by a vote of not less than two thirds of the Committee on Membership, may, by unanimous vote of the Committee of Seven, be elected to membership and such applicant shall become a member upon the payment of the annual dues for the current year."

Dr. Swarts, acting under instructions from the Executive Committee, moved that this amendment be amended by striking out the words, "two-thirds" and inserting in lieu thereof, "two members," and by striking out the word "unanimous" and inserting in lieu thereof, the words "a majority," so as to make the amendment, as follows:

"Provided, however, that during the interval between any two meetings of the Association any applicant whose application has been reported favorably by a vote of not less than two members of the Committee on Membership may by a majority vote of the Committee of Seven be elected to membership, and such applicant shall become a member upon the payment of the annual dues for the current year."

Dr. Freeman moved that the amendment as amended be adopted. Carried unanimously.

Papers were then read as follows:

Measures taken by the Cuban Government to prevent the introduction and spread of cholera in Cuba, by Dr. Juan Guiteras, Director of Public Health, Cuba.

Measures adopted by the United States Government to prevent the introduction and

spread of cholera in the United States, by Dr. John F. Anderson, Director, Hygienic Laboratory, United States Public Health and Marine Hospital Service.

The three papers named above, all pertaining to Asiatic cholera, were discussed by Drs. Snow, Swarts, Kean, Bryce, and Guiteras.

Passenger Inspection, by Dr. Antonio Cueto, Special Medical Inspector, Havana, Cuba.

Disinfection in Havana, by Dr. Gabriel Custodio, Chief of Disinfection, Havana, Cuba. Discussed by Dr. Dreyfus.

A study of air and contact infection at the Providence City Hospital, by Dr. Charles V. Chapin, Superintendent of Health, Providence, Rhode Island. In the absence of Dr. Chapin, this paper was read by Professor Gorham. Discussed by Dr. Guiteras.

The report of the committee on the education of the public as to the communicability and prevention of gonorrhea and syphilis. Discussed by Drs. Schenck, Dowling, Snow, Mohr, Woodward, Guiteras, and Swarts.

The meeting then took a recess until 8 o'clock p. m.

The Association was called to order at half past eight o'clock, p. m., in the Ateneo, the President in the Chair.

Addresses of welcome were delivered as follows:

On behalf of the Republic of Cuba, by Hon. Dr. Manuel Varona Suarez, Secretary of Sanitation and Charities.

On behalf of the Medical Profession, Dr. Juan Guiteras.

On behalf of the Local Committee, Dr. Federico Torralbas.

On behalf of the United States of America, Col. W. C. Gorgas.

On behalf of the Dominion of Canada, Dr. Peter H. Bryce.

On behalf of the Republic of Mexico, Dr. G. Mendizabel.

The president of the Association then delivered his annual address.

The meeting then adjourned.

ROBERT M. SIMPSON,
President.

WM. C. WOODWARD,
Secretary.

(The minutes of the meetings of the third and fourth days will be published in the July issue of the JOURNAL.)

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

(Abstract of Proceedings.)

The April quarterly meeting of the Massachusetts Association of Boards of Health was held at the Hotel Brunswick, Boston, Thursday, April 25, 1912, President Henry P. Walcott presiding.

On the report of the Executive Committee the following new members of the Association were elected: Edmond F. Cody, M. D., City Physician of New Bedford; Edwin H. Place, M. D., Boston; R. M. Raymond, M. D., Chairman of the Framingham Board of Health; C. J. Carr, M. D., of the Framingham Board of Health; W. P. Coues, M. D., of Boston; James H. Walsh, M. D., Bacteriologist of the Fall River Board of Health; Edwin O. Childs, Jr., of the Newton Board of Health.

COMMITTEE REPORTS.

Report of Committee on Milk Legislation.

MR. BOLLING. Mr. Chairman, the Committee on Milk Legislation desire to report that the bill introduced at the present session of the Legislature is tabled in the Senate awaiting the final disposition of House Bill 2124, the so-called "Meaney Bill," which has been reported favorably by the joint committees of Public Health and Agriculture. This latter bill to an extent incorporates among its provisions the powers asked for in the bill presented by authority of this Association. The Meaney Bill is now before the House Committee on Ways and Means.

Report of the General Legislative Committee.

MR. BOLLING. The General Legislative Committee desires to report that the several bills criticised at the last meeting of this Association, viz., bills providing for appeals from decisions of local boards of health and for a re-organization of the State Board of Health have been given leave to withdraw by the Committee on Public Health, the acceptance of which reports by the Legislature has disposed of these matters for the present year.

A bill introduced by Dr. Richard C. Cabot, providing for the earlier reporting of births by physicians and midwives and the daily report of same by the city or town clerk or registrar to the local board of health, has been enacted, and as you probably all have been notified is Chapter

280 of the Acts of 1912. Your committee was pleased to aid in the passage of this bill.

The bills introduced by the Salem Board of Health and the Women's Municipal League of Boston, petitioning that authority be granted local boards of health to make rules relative to keeping of food stuffs, etc., were incorporated in Senate Bill No. 371, which was enacted April 8.

An act signed by the Governor on April 15 gives more comprehensive powers to local boards of health relative to licensing of stables.

There is nothing now pending of general interest to local boards of health other than the several bills pertaining to the inspection of milk.

Report on Method of Nominating Officers.

Dr. Denny. The report of the committee appointed at the annual meeting to consider the question of changing the method of nominating officers of the Association:

The Constitution of the Association provides that the officers shall be elected at the annual meeting, but it does not prescribe the method of nominating or electing the officers. It has been the custom of the Association to have the Nominating Committee appointed at the annual meeting by the president, or in his absence by the presiding officer of the meeting. The nominating committee thus appointed retires during the course of the meeting, makes its nominations and, returning to the meeting, gives its report.

The work of the committee is of necessity hurried, as they must report before the adjournment of the meeting. They have no opportunity to consult with other members of the Association, or even to get the consent to serve of the men they wish to nominate.

Your committee, therefore, feels that it would be a distinct advantage to have the nominating committee appointed at the October meeting. The committee would then have an abundance of time, and a ballot could be printed and mailed to all members with a notice of the annual meeting.

Another change which we should like to suggest is a plan which has been found to work well in other societies, and that is, to allow nominations to be made for any office by ten or more members of the Association. Thus, on a request signed by at least ten members, any name may be put on the ballot together with the nominees of the nominating committee to be voted on at the annual meeting.

As the method of nominating and electing the officers is not prescribed by the constitution or by-laws of the Association, it would seem to be permissible to change the method of making the nominations simply by vote of the Association. Therefore, if the Association favors the changes suggested in this report, we would propose the following votes:

(1) That the committee for the nomination of officers be appointed at the October meeting by the chairman of that meeting.

(2) That nominations may be made for any office by ten or more members who make the request in writing to the nominating committee at least three weeks before the annual meeting: the nominations thus made, together with the nominations of the nominating committee shall be printed on a ballot to be sent by the secretary to the members with a notice of the annual meeting.

F. P. Denny,
F. M. Kennedy,
G. E. Bolling.

Moved and seconded that the report of the Committee on Method of Nominating Officers be laid on the table until the next meeting. The motion was carried.

Papers Presented.

The following papers were then read:

The Development of a Municipal Laboratory by Mr. G. E. Bolling, of Brockton.

Statistics Regarding the Increased Number of Throat Infections in Boston during February, 1912, by Dr. William P. Coues, Boston.

(These papers are printed elsewhere in this number.)

Further Business.

Dr. Washburn. Mr. President, at the last meeting of the Association, I think it was upon my motion, a legislative committee of three was appointed. Since that time it has seemed advisable, if it could be done, that the legislative committee appointed at that meeting should be merged with our Milk Legislation Committee, in order to prevent duplication of work. I therefore move that our Milk Legislation Committee and our General Legislative Committee be merged.

Doctor Washburn's motion was seconded and carried.

Mr. Whiting. Mr. President, some time ago the Boston Board of Health undertook a revision of its rules in regard to the delivery of milk to houses in which there exists an infectious disease. It seems to me that that subject is of even more importance now than then, inasmuch as much milk is now delivered to customers through stores and there is no provision for the handling of those empty packages which come from infected houses served through the store trade. I would therefore suggest, being a matter of interest, I think, to this Association representing local boards of health, that the subject of making regulations for delivery

of milk to such houses be left to a committee to be appointed by the Chair, the report to be made at the next meeting.

Mr. Whiting's motion was seconded and carried.

Retirement of Doctor Durgin.

Mr. Coffey. Mr. President, it seems to me that we ought not to break up today without putting on record in some way our appreciation of the work that has been done for this organization by our First Vice-President, and also putting on record our expression of regret that before this organization meets again he will have severed his connection with the health department of the city of Boston. Whether this is generally known or not, I do not know,—it has been in the public press. At all events, before we meet again our First Vice-President, Dr. Durgin, will have voluntarily severed his connection with the Boston Board of Health and will close a career of more than forty years in that capacity. Those of us who were at the birth of this organization know how much he did for it. Those of us who have manned one of the oars know how great a work he did to build this organization up and make it what it is and what it has been. It seems to me that we ought to put on record today our regrets for Boston, Massachusetts, and this organization, and general sanitation, too, that he is about to sever his direct connection with the preservation of the public health.

I understand, too, that soon after he closes his official career he intends to cross the water. The recent calamity has made known to us how hazardous, after all, that trip may be; how puny, when the Almighty raises his hand, are the efforts of humanity to meet the perils of the sea; and it seems to me that we ought to express here today our wishes for a safe passage and a happy return to us.

I hope and trust—and I feel sure you all will echo my words and agree with me—that when he returns we will see him here at our meetings and that we will have the benefit of his knowledge and his experience and his advice in the future for a great many years as we have had in the past.

My own indebtedness to him has covered nearly a generation. When I, not much more than a mere boy, was appointed health officer in Worcester, I came to Boston looking for information. I have found him for nearly a generation a fountain of knowledge, experience and advice, and I have not the least doubt that all the other health officers of Massachusetts have found him as I have, that same fountain of knowledge and experience. I never yet came to him looking for knowledge or advice that I did not get it in the most kindly and in the fullest manner. As I said before, my indebtedness to him is very, very great, and I never shall forget his kindness to me and his help to me. And so I say that the whole

State of Massachusetts ought to regret the severance of this veteran from the work of sanitary science.

I move that this organization put on record its regret that our First Vice-President is about to sever his connection with the health work of the city of Boston, and also its wish that he may have a safe passage and a happy return to our shores.

(The motion was seconded by several members.)

THE PRESIDENT. In putting Mr. Coffey's motion I should like to say simply two words: that I have known Dr. Durgin longer even than he has known him, that I know that we are losing from the port of Boston the ablest health officer in the United States, unquestionably (applause), and that I know in the next place, having served with him and Mr. Coffey in this Association from the beginning, that it owes more to Dr. Durgin for its success, for the interest you have taken in its meetings, than to any other single man. Will you adopt the motion proposed by Mr. Coffey? All those in favor will rise. (Everybody rose.) There is nobody else can rise; it is a unanimous vote.

DR. KENNEDY. This is a good time for each one personally to express himself as to the qualifications of Dr. Durgin as a sanitary expert and public official.

Dr. Durgin's courtesy is unfailing and his wise counsel so often sought by the New Bedford Board of Health is highly appreciated and followed by the board.

The President of this Association has just said, and I have heard it said by others, that throughout the country Dr. Durgin is known as the foremost sanitarian.

DR. DURGIN. Gentlemen, after saying to you that I am taken somewhat by surprise I am tempted to say that had I anticipated anything of this sort today I would have been tempted to be busy at my office. But I thank you for your kind expression. (Applause.)

The President appointed Dr. Bailey of Cambridge to serve as a member of the Sex Committee on account of the resignation of Mr. Kruesi. The President appointed Dr. Slack, Dr. Coolidge, Dr. Coues and Messrs. Bolling and Whiting as the committee to take up the subject of making regulations for the delivery of milk to houses in which there exists an infectious disease.

PRELIMINARY REPORT OF THE COMMITTEE ON METHODS OF CHEMICAL MILK ANALYSIS

Read before the Laboratory Section American Public Health Association, Havana, Cuba, December, 1911.

To the Members of the American Public Health Association.

Your committee begs to submit the following preliminary report:

Milk solids: Evaporate 5 gms. milk over boiling water in flat bottomed dish for two hours; cool and weigh.

Mineral matter: Ignite above residue at red heat to white ash; cool and weigh.

Determination of fat: Babcock method.

Milk sugar. (a) Optical method: Polarization of filtrate obtained by action of mercuric nitrate solution or of mercuric iodide solution upon milk. (b) Gravimetric method: Place 25 gms. milk in a 250 c.c. flask, add 0.5 c.c. 30 per cent. acetic acid; shake. Allow to stand for a few minutes, add about 100 c.c. boiling water; shake; add 25 c.c. alumina cream; shake and set aside for 10 minutes. Filter through a wetted ribbed filter, use wash water and make filtrate and washings up to 250 c.c. Act on this reducing sugar solution with copper sulphate solution and aklaline tartrate solution, and from the weight of the resulting cuprous oxide determine the amount of lactose present from tables of Munson and Walker, page 243, Bulletin 107 revised, Bureau of Chemistry, U. S. Department of Agriculture.

Added water: Acetic acid, Zeiss immersion refractometer method; also Lythgoe's method, employing copper sulphate solution for obtaining a clear filtrate for subsequent examination by immersion refractometer. By acetic acid method, 208 known purity samples gave refractometer reading in every instance above 39.0°.

Dirt: Heat milk in water bath to 45°C. Dirt collected upon thin layer of absorbent cotton by passing milk through percolator (latter may be made from liquor bottle by removal of bottom. For this purpose the bottle is then turned upside down.) Cotton plug held in place by inserting it into percolator by means of a cork stopper, through which a hollow glass tube passes, to permit escape of milk. If filtration is slow, it may be hastened by suction, using a side neck filtering flask. Dirt collects on cotton; free latter from milk by means of a little water. Plug of cotton with adhering dirt dried may be preserved indefinitely.

Graduated glassware: Endorsement of standard adopted by Association of Official Agricultural Chemists, recommended. The committee suggests the advisability of having the neck of the Babcock bottle of such a diameter that a volume of 2 c.c. shall not occupy more than 70 millimeters or less than 55 millimeters.

JAMES O. JORDAN,
Chairman.

BOOK REVIEWS

Dusty Streets and Tuberculosis. *A partial review of "Mortality from Consumption in Dusty Trades," Bulletin 71, of the Bureau of Labor, United States Department of Commerce and Labor. By Frederick L. Hoffman. March 1909.*

This Bulletin is misleading in that it conveys an impression regarding the seriousness of street dust as a disseminator or contributory cause of tuberculosis which is not supported by the evidence.

There are two reasons alleged for considering street dust dangerous. 1st. That it contains vast quantities of tubercle bacilli, derived from consumptives spitting on the streets. 2nd. That the irritating qualities of the dust itself contribute to keeping the mucous membranes in an inflamed condition, and so extra-susceptible to any infection with tuberculosis which may be received from any source.

The first, that street dust is full of tubercle bacilli, has been exploded pretty definitely in the last few years. This bulletin itself admits that such bacilli are not found living in street dust. Further quotations of authorities on this subject may be offered, but in view of this admission are unnecessary.

We are therefore restricted to the second factor,—the influence of irritating dust from the streets in injuring the mucous membranes.

Let us admit at once that this is plausible, and then let us take the actual figures of this report, and see if the plausibility is supported into an actuality. We are not as serious professional public health men, interested in what *may* by some flight of the imagination be conceived of as a possibility, but in what *is* in truth, a fact. Nor are we greatly concerned with how the 1% of cases of disease *may* be contracted, but with how the 99% *are* contracted.

The first table of this bulletin deals with consumption amongst street cleaners. These persons are selected as peculiarly exposed to street dust. The author himself states that his data are not entirely conclusive; but it can be shown that they are meaningless.

Our author gives the percentage of deaths from tuberculosis to deaths from all causes amongst street cleaners as 18.3. He then compares this with the similar percentage amongst *all males in the whole registration area.*

It is obviously wholly unfair to select a single class of city dwellers (street cleaners) a poorly housed, poorly fed, and unprogressive class at best—and to compare them with the population of the whole registration area, including the rural districts.

The only fair comparison would be with the *same* class of city dwellers, *not* exposed to street dust. In the census lists, "porter and helpers (in stores)" seem to be nearest to the condition of street sweepers in physique, pay, manner of homelife, etc., and are *not* similarly exposed to street dust.

Unfortunately the street sweepers table cannot be compared directly with the porters table because they relate to different periods. It is sufficient to note that the street cleaners table is based on such meager figures that had one additional death been from consumption rather than from other causes, at age 25–34, this one death would change the percentage from 44 to 50; that the reverse difference, reducing the consumptives deaths by one would change the percentage from 44 to 39, and that seven less deaths in the total would reduce the high figures for street cleaners to the level of that for the *whole registration area.* A table in which such small changes can so greatly affect the results is surely not a table on which to base final deductions.

Turning now to the second item; drivers, teamsters, hackmen, etc., are selected by the author of the Bulletin as illustrating another class much exposed to municipal dust.

The Bulletin states as follows:

"Drivers and teamsters perhaps more than any other class of outdoor workmen are exposed to the risk of considerable and continuous inhalation of municipal dust. By

reason of the usual position of the driver's seat, perhaps 8 feet or more above the ground, the degree of exposure is however much less than in the case of street sweepers and refuse collectors."

The author goes on to enumerate other disadvantages of this class—low wages, long and uncertain hours, sitting in a fixed position for long periods, night work, temptations to dissipation, and the fact that the ranks of this class are often recruited from failures in other lines of endeavor.

Despite these admitted peculiar disadvantages of this class, the writer compares the percentage of tuberculous deaths amongst them, not with that of a similar class, nor with that of city dwellers of any class, nor even with city dwellers as a whole, but again with the percentage for *the whole registration area.*

"Drivers, teamsters, hackmen, etc.," should be compared with a class exactly similar to them, if possible, with the exception of nonexposure to street dust, if the influence of street dust is to be thus determined, and not with a huge mixed population of lawyers doctors, clergymen, farmers, etc.

I have been able to secure figures for 1909, comparing "porters and helpers (in stores, etc.)" with "draymen, hackmen, teamsters, etc." (Bulletin 108, Bureau of the Census Mortality Statistics for 1909, P. 133.) Here we have two somewhat comparable classes, distinguished chiefly by this—that one class is out in the street dust pretty continuously, the other working about between the street and indoors, but a good deal indoors. The figures follow.

Percent of deaths from consumption to deaths from all causes amongst Porters and Helpers (in stores) and amongst Draymen, Hackmen, Teamsters, etc.

Ages.	Porter, etc.	Draymen, etc.
25–34	38.3	35.8
35–44	31.6	29.3
45–54	21.6	18.2
55–64	10.3	10.2
	27.4	25.4

Here we find in totals and at every age that the "porters and helpers" exceed the "draymen, hackmen, teamsters, etc.," in the per centage of tuberculous deaths.

The total percentage for street cleaners as given by Mr. Hoffman is 21.1 per cent. Now note the sequence.

Taking the gross totals as thus derived, it appears that the highest percent is amongst "porters and helpers," the next lower amongst "teamsters and drivers," the lowest among street cleaners; that is—*the deaths from tuberculosis on this basis* DIMINISH *as the exposure to municipal dust* INCREASES.

Watchmen, policemen, firemen, etc., are surely exposed to municipal dust—quite as much as draymen and teamsters. Moreover on the principle advanced by the writer of this bulletin, the policemen at least should be more exposed since being on foot he is nearer the ground.

The figures for 1909 are for this group 24.2, 17.8, 9.5, and 4.9 using the same age groups or a total percentage of 19.0, which falls below any of the others. It will at once be claimed that this class is a selected class, strong physically, well fed, well cared for. This is of course true. *But is it any more unfair to select this class, an exceptionally fine body of men, to illustrate the non-effect of municipal dust, than it is to select teamsters, cabmen, etc., an exceptionally poor body of men, to illustrate the converse?*

Please let me emphasize the point that I am not disputing the allegation that street cleaners and cab drivers suffer a high percentage of attack from tuberculosis. What I do insist on is that in view of all we know of tuberculosis, it is not quite fair to attribute the high percentage to street dust, when there are so many other factors at work. Only an enthusiast for the principle that street dust produces consumption could comfort himself with such evidence as is presented here. The Bulletin itself quotes Thomas Oliver regarding these very men to the effect that alcoholism and exposure to cold are responsible for their tendency to develop gout and rheumatism, and *through these diseases,* to *secondary* affections of the lungs, heart and respiratory organs. Municipal dust is certainly not a cause of alcholism, of exposure to cold, of gout or of rheumatism.

There are many other points which go to

show that other factors than dust are at work. For instance, *rural* draymen, hackmen, etc., (Part 1, Census of U. S. 1890) show a tuberculosis death rate of only 105 per 100,000 living;* while *city* draymen, hackmen, etc., show a rate of 363 per 100,000 living, yet the *rural* draymen, hackmen, etc., surely encounter dust as much as do the *city* draymen, for in the cities the streets are more or less cleaned and watered while in the country neither is done.*

It is a striking fact that miners and quarrymen whom we usually think of as peculiarly exposed to dust, show percentage figures for tuberculosis deaths compared with deaths from all causes far below any other class, boatmen, and sailors coming next. On the other hand, painters, plumbers, boot and shoe makers, printers, tailors, bookkeepers, clerks and copyists, bartenders and others show figures as high or higher than the draymen, at least at the active periods of life. Steam-railroad employees surely have the most continuous exposure to dust in the sense of irritating particles in the atmosphere, of any ordinary outdoor occupation, yet their tuberculosis percentage is very low.

But my statistics based on these percentages are no better than those of the author of the Bulletin, because *the tables on which this Bulletin bases its conclusions and the ones I have used above, are the very tables concerning which the Census Bureau specifically warns everyone not to base such conclusions.* Mortality statistics for 1908, p. 79 says:

"The relation of occupation to mortality is one of the most important and also one of the most difficult subjects of vital statistics . . . the tables presented in the present report (1908) have been prepared . . . more particularly to pave the way for more complete and accurate statistics of the mortality of occupations than have heretofore been available."

P. 87. "The greatest caution must be exercised in the use of tables VII to XII—"(tables of the very type used by Mr. Hoffman,)" and emphasis must be placed upon a thorough understanding of just what they do and do not mean, and for what they may or may not be used."

The Census Bureau then goes on to point out the fallacies involved in comparing the *percentage of deaths from one disease to deaths from all causes* in one occupation, with similar percentages for other occupations, giving the reasons therefor, and indicating specifically that although 41.2 per cent of tailors deaths from tuberculosis and but 5.3 per cent of the deaths of miners and quarrymen, were from the same disease *it does not follow that the death rate from tuberculosis i. e. (deaths from tuberculosis per total employed persons) of the lungs is in reality lower amongst the miners and quarrymen than amongst the tailors.* Since Mr. Hoffman has used these very tables to show just what the Census Bureau says they do not and cannot be used to show, his main argument falls to the ground.†

It seems clear then, 1st, that the evidence offered is untrustworthy in itself, and admitted to be so by the author; 2nd, that it can be made to prove the exact reverse of the alleged conclusion: 3rd, that the use of the evidence presented to estimate relative unhealthfulness of occupations has been condemned for this very purpose by no less an authority than the actual compilers of the tables themselves—*i.e.*, the United States Census Bureau; 4th, that the author himself quotes Oliver to the effect that tuberculosis amongst hackmen, etc., is *secondary* tuberculosis—*i.e.*, secondary to other affections which are not due to dust at all.

There are at work factors far more direct and unequivocal in influencing these rates than the mere exposure or non-exposure to dust.

Chief amongst these is opportunity for infection, *i.e.*, close unguarded association with previous cases. The lumberman closely associates, in the bunk and mess houses, at evil-smelling close-quarters, with other people. He contracts readily all those infectious

* The estimates based on deaths per 100,000 living are unequivocal, while as is shown later, comparisons based upon the percent which one cause of death is to all causes, is quite fallacious.

† It is easy to understand the fallacy. If in a given occupation there is a total of 1000 deaths, including 10% from tuberculosis, the percent of tuberculosis is 10%; but if only 500 died from all causes including the 100 from tuberculosis, the *same 100 deaths* from tuberculosis would be 20% of the total.

diseases, smallpox, typhoid fever, etc., *to which he is exposed*. But he does not contract tuberculosis because he is not exposed to it. Why is he not exposed to it? Because the people a lumberman comes in contact with have not open tuberculosis. They could not "hold their jobs" if they had. Therefore the lumberman escapes. The miner also lives in evil surroundings, from a sanitary standpoint. He is not, like the lumberman, much in the open air; he constantly encounters dust and dirt and filth. Like the lumberman he contracts all diseases that result from contact, but he does not contract tuberculosis because he does not associate with open cases.

The city dweller, whatever his personal habits or his home life, is constantly encountering swarms of people. He is in contact, more or less intimately, with more different new people in a day than a lumberman or a miner or a farmer is in a month. Hence he contracts tuberculosis with greater frequency.

Poverty alone, poor food alone, alcoholism alone or all these combined, are helpless to produce tuberculosis without infection, and infection is a matter of intimate association with sources of infection. Why wait until poverty and alcoholism are abolished, good food provided, municipal dust vanquished and all the other dreams of the millenium accomplished, instead of taking hold definitely of the one essential inevitable factor, without which these things cannot produce tuberculosis, and with which riches, temperance and good food are powerless to prevent tuberculosis—*i.e.* the infected person? Why harp upon, make much of, campaign against and spend money for what is like dust at most only a 1% possible contributory factor in, while wholly neglecting the open case which is the 99% factor?

H. W. Hill, M. D., D. P. H.

Director, Division of Epidemiology, Minn. State Board of Health.

Sewage Disposal. *By George W. Fuller, Consulting Engineer and Sanitary Expert, Member of the American Society of Civil Engineers. Octavo, 767 pages, amply illustrated with tables, plans, and cuts. Cloth, $6.00 net. McGraw-Hill Book Company, Publishers, New York. 1912.*

Mr. Fuller's book has been heralded for some time through advance publication of certain chapters, and those interested in the subject, have awaited its appearance with pleasurable anticipation. Mr. Fuller would of course produce a good book but the actual production comes as a pleasant surprise even to those who know him best and expected the most from him. Apart from other considerations, one naturally asks, "When did a busy engineer find time for such a work?" The answer is the keynote of the book. It is not a thing apart from the author's professional life; it is of that life—a mere transfer to the printed page of the author's extensive knowledge as it lies in orderly arrangement in his own mind.

It is a well proportioned admixture of the experiments, the readings, and the ponderings of a student; and of the works and the experience of the designer and builder; a work which few would undertake and fewer still accomplish.

Mr. Fuller begins his treatment with a discussion of the fundamentals, the chemistry and bacteriology of sewage. Here is a well discussed compilation of existing data. The significance of the various items of a chemical analysis; the mutual relations of population, volume of sewage and strength; and the daily and seasonal variations, are considered. The sludge problems which form such an important part of subsequent chapters is introduced here as a physical and chemical property.

The older methods of analysis are thus summarized,

"But, generally speaking, the results of such tests are a disappointment, as they show but little as to the character or source of deoxygenating properties of the organic matter, and about which knowledge is needed for the advancement of the art of sewage disposal."

The newer views of the oxygen requirements of a sewage, which Mr. Fuller himself

recognized as early as 1903, are treated extensively and brought up to date.

The bacteriology of sewage is treated from two viewpoints, the purely biological and the public health. Fermentation and putrefaction are discussed at length. Following Herter, they are regarded as generic terms, referring to the chemical and not to the aerobic and anaerobic conditions. Fermentation is the bacterial cleavage of carbohydrates, putrefaction, of proteid and allied substances. This view is further supported by quotations from Kendall. Decomposition of organic matter in general, as treated by Nichols, Drown and others and of sewage matter itself; nitrification and denitrification; and the reduction of sulphur compounds, are treated as bio-chemical reactions. The following is a typically concise statement of terms often misused.

"So long as available oxygen is present the sewage is fresh. When anaerobic decomposition begins it is stale. For a time it is the soluble organic matter that is then decomposed through the protoplasmic activities of the bacterial cells. Sooner or later enzymes are excreted by the anaerobic bacteria and these soluble products proceed to liquefy and gasify suspended organic matters. This is spoken of as the septicization of sewage." Chapter III on odors is a practical application of some of the principles laid down.

From the public health standpoint sewage bacteriology relates to epidemics of water-borne diseases. A concise review of these is followed by a statement of the Washington results, "Hazen's theorem," and some apparent exceptions in New Jersey cities where mechanical filtration is employed. A striking result at Cincinnati is given in full and Dr. Landis' view that the mortality in other than hitherto recognized water-borne diseases is unaffected by improvement in the water supply seems hardly to be supported by the figures.

A chapter devoted to shellfish is most complete and worthy of separate publication. Under the heading "Position of State Authorities" however one is surprised to find no reference to the extensive work of the Rhode Island Shell-fish Commission.

In chapter VI the problem of Sewage Disposal is attacked. To illustrate its diversity certain typical cases are discussed in detail. The following chapter deals with experiment stations, their results and their limitations.

"Experimental data from a combined engineering, chemical and biological viewpoint have been a powerful factor in promoting efficiency and economy in sewage disposal projects. Particularly was this true some years ago, when it was out of the question to secure data from works in practice. Their utility is less now than formerly, and designing engineers now look more to results of operation on a large scale. But the establishment by tests on a small scale of underlying principles of sewage disposal, even if meager sometimes as a guide to completely satisfactory designs, has been of notable aid in the advancement of this field of sanitary science."

The chapter on dilution is exceedingly valuable. There is a complete summary of all important investigations of this most vital subject. Bodies of water are properly regarded as a resource, to be conserved. Their proper use for sewage disposal, must eventually by found to lie between the two extremes of gross pollution and pristine purity. In no other field of sewage disposal is scientific study so urgently needed and so piteously lacking. The author's compilation of data valuable as it is, only emphasizes the lack of real knowledge and even of any real scientific method of attack.

Special treatment is given to the matter of dilution in large lakes, involving new problems, and the attempts of the various lake cities to solve their problems are given in detail. Similarly the sea-board cities are cited. The treatment of the New York harbor situation is especially full and leads up to a discussion of recent work upon oxygen diffusion, and reaeration.

With chapter XII the treatment becomes more strictly engineering, although throughout, the theoretical and fundamental view point is maintained. The mass of compiled material in design, efficiency and cost lends itself poorly to the purposes of a review. Suffice it to say that each of the kinds of sewage treatment is taken up and discussed

fully with statistical references to all that is good in the literature. Here are treated in order, screening, sedimentation, chemical precipitation, electrolytic treatment, strainers and colloidors, irrigation, sand, contact and sprinkling filters, aeration, hypochlorite treatment, ozone, and residential plants.

A comparative summary closes the book. Here Mr. Fuller warns against standard methods of treatment and by inference against the too prevalent practice of copying successful works without careful study of conditions. He divides methods into well established, recently developed, limited, waning and unestablished. Comparative efficiency and cost are taken up and the chapter closes with a plea for good management supported as usual by citations of actual cases.

The book will become a standard authority, in America at least. It is the result of a continuous experience with the problem since the early days of its scientific study and combines with it a full statement of the author's personal experience and resulting views, a compilation of data which will prove invaluable to the practicing engineer.

Earle B. Phelps.

Home Nurse's Handbook of Practical Nursing. A Manual for use in Home Nursing Classes, in Young Women's Christian Associations, in Schools for Girls and Young Women, and a working text-book for mothers, "practical" nurses, trained attendants, and all who have the responsibility of the home care of the sick. *By Charlotte A. Aikens, Author of "Hospital Management," "Hospital Training-School Methods," "Primary Studies for Nurses," "Clinical Studies for Nurses," 12mo of 276 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, $1.50 net.*

"By the most fundamental of all laws," says Charlotte A. Aikens in the preface of her book entitled Home Nurse's Handbook of Practical Nursing, "women are the nurses of the world. Few, if any women escape the care of some sick or helpless one. All women have the responsibility of the nursing of health in the home, or the prevention of disease."

Miss Aikens' book fills a distinct need in its effort to instruct young women, married and unmarried, in the details of home nursing. It is a lamentable fact that most of the knowledge which mothers acquire with regard to nursing of children and of adults has been picked up from sources which are to say the least, questionable in character and in accuracy of technique. Many hours of pain and suffering, much physical labor, the prevention of needless disease, and the general improvement of health in the home would result if mothers were competent nurses.

Miss Aikens' book is not an attempt to give a detailed course in nursing. The book is written primarily for classes of young women in churches, schools and elsewhere, who wish to study the problems which will confront them in later life. It is written in the form of a text-book, but this fact does not detract whatever from its readability, nor from its value as a handbook in the home.

The book is filled with practical suggestions concerning the care of the sick and concerning the prevention of disease. For instance, very few young women or mothers know what things are necessary to have ready in the home in case of sickness, or concerning the proper method of making a bed or of handling an invalid. The feeding of the sick is a question, upon which the average housekeeper has very little information. The giving of baths and the preparation of packs, both hot and cold, the every-day care of the baby, the giving of medicines, bandaging in case of accident, and the all important subject of maternity nursing,—these are but a few of the numerous topics with which Miss Aikens' book deals.

There is no attempt in the book, however, to provide home treatment without a physician. The home nurse, as much as the registered nurse, needs the skillful direction of the physician to make her nursing of value.

Philip P. Jacobs.

HEALTH DEPARTMENT REPORTS

State of New York.

The preliminary extract of the 1911 report of the New York State Department of Health made by Commissioner Eugene H. Porter points out the necessity for more adequate quarters for the State Laboratory, particularly in regard to the manufacture of antitoxin. Previous recommendations as to the necessity for revision of the state health laws are renewed.

The first report of the work done under the new Cold Storage Law is presented. The majority of the cold storage warehouses have shown a disposition to fully comply with the provisions of the statute, several however had to be prosecuted—particularly in regard to the matter of stamping goods received in and delivered from storage. Several concerns were prosecuted and convicted, the most important case being that of the Greenwich Cold Storage Company of New York, which after the case was brought before the Court of Special Sessions in the City of New York, was fined $400, and the contention that the act was unconstitutional rejected.

Educational work in Oral Hygiene has been successfully carried out and a third lecturer had to be appointed to assist in the work on account of the demands received from many sections.

The Division of Sanitary Engineering has continued its admirable work on the protection of water supplies and the problems of sewerage and sewage disposal.

Of particular interest is the work done in connection with the sanitary conditions of summer resorts. The state was divided into thirteen summer resort districts and careful studies made of the many popular resorts in the state. The names and location of those resorts where the proprietors failed to eliminate insanitary features after repeated notices are published in the monthly bulletin of the Department or in the press. It is interesting to note that the Department annually receives many requests from vacation seekers concerning the sanitary status of the resorts. This is indeed a sign of the times.

The death rate for the state was 15.5 per 1000. There were actually 2,091 less deaths reported in 1911 than in 1910. Dr. Porter says that it is safe to say that the largest contribution to morbidity as well as mortality during the year was epidemic influenza; 1700 deaths were reported as directly due to this disease, but this represents only a few of the deaths from other causes which were indirectly due to or hastened by influenza. Cancer death rate increases steadily and it looks as if within twenty years there will be more deaths from cancer than from consumption.

The report is extremely instructive, sound and well written, and offers good evidence of the valuable work being accomplished by Dr. Porter and his associates.

Milwaukee, Wisconsin.

The annual report of the Health Department for 1911 differs very materially from those issued in the past years. The report is of a much more popular nature, and the many illustrations which are included must make it of greater educational value to the citizens of Milwaukee. Considerable attention is paid by Dr. F. A. Kraft, the Health Commissioner, to the Milwaukee water situation. It will be remembered that various experts have stated, that, in their opinion based on very careful studies of the water supply, the Milwaukee water supply which is obtained from Lake Michigan, should be purified because of the fact that at certain times when the wind is blowing from the south, the sewage of the city readily finds its way to the water intake. Dr. Kraft points out that during the year he has endeavored by the issuance of reassuring

statements to quiet the unduly alarmed public concerning the danger of the water, and that he deems it senseless and wrong to excite fear of a condition against which the public is helpless. He evidently recognizes that the water supply is polluted, and in his report urgently recommends the Council to take immediate steps to install a sterilization or purification plant and for this purpose recommends that an ozone plant be erected. The expert engineers recommended filtration of the Lake Michigan water, but Dr. Kraft is very sceptical with regard to the merits of this method of purification, and states that "this scepticism arises out of a knowledge of the experience of other cities, particularly the city of Pittsburgh which expended more than $10,000,000 to perfect a plant now in operation there and not yet a bacteriological success."

Considerable work has been done during the past year on Factory Inspection and in many instances systems to remove dust and fumes have been installed and many other improvements brought about. Between six and eight hundred bubbling drinking fountains have been installed in factories. Reference is made to the new housing Commission recently appointed, and the prediction is made that many of the evils now existing will be done away with. Mr. F. W. Luening, the head of the Bureau of Education and Publication of the Department makes an interesting report. The monthly bulletin of the Department started by Mr. Luening has increased its circulation from six hundred to eight thousand, and Mr. Luening's Bureau designed and executed the first Public Health Exhibition in Milwaukee. This Exhibition was extremely well prepared and was very successful.

Over six thousand bacteriological examinations were made in the Bacteriological Laboratory, and the Bacteriologist, Dr. Ruhland, as the result of his bacteriological analysis of the water states that B. coli was found in 44.69 of one cubic centimeter samples.

The death rate per thousand was 12.32 as against 13.90 for 1910. There were 561 cases of typhoid fever reported as compared with 1605 during 1910, and there were decreases noted in both scarlet fever and diphtheria. Tables are given in the statistics showing the contributory causes of death as well as the principal cause. The report includes that of the Child Welfare Commission. This Commission amongst other things, has been making a special effort by concentrating all known methods for the prevention of infant mortality in a certain section of thirty-three blocks of the city, to see what improvement could actually be brought about. This experiment is now being carried on and the constant watchful supervision that has been exercised over those babies born in this district seems to have resulted in a marked decrease in the infant death rate. During the last quarter of 1910, there were 128 births in this special district, and during the the same period of 1911, 158. The death rate per hundred births for this period in 1911 was 4.4% as against 12.5% in 1910. Further reports of this work will be awaited with much interest. Wilbur C. Phillips is Secretary of this Commission.

PUBLIC HEALTH NOTES

Canada's Protest.

The Commission of Conservation of Canada has recently issued a number of publications dealing with the further diversion of water from Lake Michigan for the Chicago Drainage Canal. These reports go into the question most fully, and should be read by all interested in this important international question.

The "Conclusions" as set forth on behalf of the Canadian Government are as follows:

1. That there is no imperative necessity for such a large diversion of water from Lake Michigan for sanitary purposes, as is requested in the application.

2. That the historical facts presented in this brief show conclusively that the Sanitary canal cannot be considered as the outgrowth and development of a scheme which has received recognition by the United States Government, or that of the Dominion of Canada.

3. That the claim that the Sanitary District is entitled, as a matter of right, to the use of so much of the waters of Lake Michigan as may be necessary for sanitary and domestic purposes, cannot be entertained in so far as it relates to the extraordinary and wasteful use proposed.

4. It has been shown that very substantial injuries have been, and are being suffered by navigation interests. Fears for future and more extensive damages, by reason of increased diversion, are exceedingly well founded, and justify the demand that some improved method of sewage disposal which shall not require the abstraction of any considerable quantity of water from Lake Michigan nor the diversion of other outlets of waters which would naturally flow into it, be adopted.

5. That the Dominion of Canada has the right to a voice in the disposition of the waters of lake Michigan for sanitary purposes in so far as such diversion injuriously affects navigation, because her citizens are accorded, by treaty, the right of free navigation in that lake, and, in that no diversion can be made without injuriously affecting her harbours, channels and canals.

6. It having been shown that the sewage of Chicago can be so treated and disposed of by other means than the present dilution methods, by which great quantities of water are withdrawn from lake Michigan and discharged through the Drainage canal into the Illinois river, it is contended, on behalf of Canada, that the abstraction of water from lake Michigan shall be limited to such quantity as shall not injuriously affect navigation interests on the Canadian side of the boundary, and, that such limitations shall take effect at the end of such time, as, in your judgment, may be reasonably necessary for the Sanitary District to install, and put into use, the works which may be required for disposing of the sewage by other means than by the dilution method now in use.

7. That, in view of the fact that the Sanitary District claim that permits hitherto issued deal only with the flow through the lower portion of the Chicago river, and that it has the right to take any amount of water, without permission, through the canal, provided it is supplied through other feeders, it is respectfully requested that all permits be only for such limited quantity of water as shall not injuriously affect navigation on the lakes and St. Lawrence river, and be so worded as to state the total quantity which the Sanitary District of Chicago may be permitted to withdraw for domestic and sanitary purposes from the drainage basin of lake Michigan.

International Congress on Industrial Accidents.

"The third International Medical Congress on Industrial Accidents is to be held in Dusseldorf from the 6th to the 10th August, this year. Previous conferences have taken place at Liege (1905) and Rome (1909), and the published proceedings of these have pro-

vided an immense amount of valuable information respecting this important modern branch of medicine and surgery. The questions to be submitted for discussion this year are exceedingly practical, and such an international exchange of views as will be provided should be of material assistance in concentrating and adding to our knowledge in this branch of study. They are as follows:—

(1) Comparative study of the Compensation Acts in force in various countries.

(2) Importance of early institution of functional treatment in cases of industrial accident.

(3) Traumatic diseases of the heart and blood vessels.

(4) Traumatism and arthritis deformans.

(5) Productive and aggravating influence of trauma on cancer.

Although these subjects are purely medical and of particular interest to medical referees and medical officers of accident insurance companies, the membership of the Congress is not restricted to the profession, but is thrown open to representatives of insurance companies and associations of employers or workpeople. Whilst it is hoped that a good number of British representatives will visit Dusseldorf, anyone interested may become a member and thus secure a copy of the proceedings without actually attending the meetings. The propaganda work for this country is being undertaken by the Association of Certifying Factory Surgeons (Incorp.), the secretary of which will be pleased to answer any inquiries addressed to 16, John Dalton Street, Manchester. Prof. Liniger, Elisabeth Str. 63, Dusseldorf, is the general secretary of the Congress."

The Medical Officer, April 20, 1912.

The Cloak, Suit and Skirt Industry.

The May Bulletin of the Joint Board of Sanitary Control of New York in the above industry contains a summary of a year and a half's work. The marked improvements in fire protection and sanitation are well indicated and the Joint Board deserves to be highly congratulated on their work. Some of the achievements of the Board as given in the bulletin are as follows:

"The Board now has a sanitary survey of 1,884 shops compared with 1,738 in the second inspection and 1,243 in the first. This indicates marked progress in the gathering of *facts* of the industry with respect to unsanitary conditions.

"The number of shops with no drop ladders has been reduced from 236 to 38, or from 13 per cent. to 2 per cent.

"The doors opening in are still with us, but their number has been reduced from 97 per cent. in the first inspection to 79 per cent. on the second inspection and to 48 per cent. in the last. . . .

"The increase in the number of dressing rooms is indicated by the reduction from 79 per cent. of shops with no dressing rooms in the first inspection, to 58 per cent. in the second and 34 per cent. in the third.

"And progress in protecting the worker from eye-strain is shown in the fact that the shops unprotected from glare have been reduced from 83 per cent. in the first inspection to 72 per cent. in the second and 51 per cent. in the third. . .

"But most significant and reassuring is the statement that 25,336 persons, or 51 per cent. of the workers, are employed in shops having our sanitary certificate. This means that over one-half of the workers in our industry work in factories in which the standards of the Board are complied with."

The total expenditures for the fiscal year was $6,938.26. The cost of the inspectional staff was $3,084.75, and the average cost per inspection 32 cents.

The Board has recently started in on the physical examination of the workers of this industry. Other industries might well follow in the footsteps of this large business. The work is primarily preventive in character.

Public Health and Clean Up Day in Michigan.

The following letter has recently been addressed by Dr. R. L. Dixon, the Secretary of the State Board of Health of Michigan, to the cities and villages of that state.

"The most important asset subject to the principles of conservation is Good Health. The largest financial burden to the people of Michigan is that produced by disease. The

diseases causing this output of money are PREVENTABLE DISEASES. The most important principle of prevention of disease is Sanitation. A proper degree of sanitation and hygiene consistently maintained will save thousands of lives and millions of dollars in this State each year.

"There are in Michigan each month over 200 deaths from tuberculosis. This disease costs us $20,000,000 a year. Add to this the cost of typhoid fever, diphtheria, smallpox, cholera infantum, and the long list of preventable diseases and the amount becomes appalling. This matter is practically within the power of public control.

"To the end that concerted activity, covering the entire state, may be established, his excellency, Chas. S. Osborn, Governor of the State of Michigan, has designated May 15, 1912, as Public Health and Clean Up Day in Michigan.

"In accordance with the spirit of his proclamation, the State Board of Health asks that it be made a day of general cleaning up of unsanitary surroundings, and the establishment of sanitary, healthful conditions. This will bring about an unmeasured good if entered into in the spirit which the movement deserves.

"We ask that Mayors of cities and Presidents of villages, through the co-operation of the local Boards of Health, extend the proclamation into every jurisdiction. It should be a day of special public health teaching in every school in the state. From every pulpit a sermon on good health might profitably be extended on the Sunday preceding. The newspapers might well anticipate the day by special editorials pertaining to the subject.

"If all concerned will participate in the work, it will mean an arrest of summer diseases which will be of untold value."

Emperor Honors the Memory of Dr. Koch.

In connection with the thirtieth anniversary of Dr. Robert Koch's announcement of his discovery of the tubercle bacillus, Emperor William of Germany has ordered that the Royal Institute for the Study of Infectious Diseases in Berlin, in which Professor Koch worked for ten years, should bear Koch's name hereafter. The emperor in his decree says:

"Professor Koch, by his discovery, opened the combat against the greatest scourge of mankind, which has been conducted since with unprecedented success and has made suffering humanity his eternal debtor."

Accident Prevention at the Remington Typewriter Works.

In the April number of *Human Engineering*, Mr. John Calder, Manager of the Remington Typewriter works and widely known as an authority on accident prevention, gives a summary of the company's experience regarding accidents to employees for the past five years. The figures show a steady increase in the number of persons employed and the number of machines in use, attended by a steady decrease in the number of accidents. In 1911 the rate of accidents of all kinds per 1,000 employees fell to 24.4. It is a most encouraging showing, and should be an incentive to others with similar opportunities. To quote Mr. Calder:—

"The works include Brass and Iron Foundries, Annealing and Hardening Departments, and a large variety of dangerous machinery worked by males and females and operating upon wood, rubber and metal. Special attention is given to scientific safeguarding and safeworking of machinery, to the maintenance of these conditions and to supervision and instruction of the foremen and employees in accident prevention.

"During the five years no fatal accident occurred and no limbs or eyes were lost. The machinery accidents were almost wholly slight finger injuries. The non-machinery accidents were chiefly slight cuts and bruises, falls, scalds or burns.

During the five year period ending December 31st, 1911, the number of employees *increased* 66 % the number of machines *increased* 25 % and ACCIDENTS OF ALL KINDS PER 1,000 EMPLOYEES DECREASED 46 %."

The Increase in Industrial Accidents.

In an article with the above title in the March number of the Publications of the American Statistical Association, Dr. Henry J. Harris, of the Library of Congress, discusses whether or not the increase in the size and the complexity of our industrial establishments must inevitably be attended by a corresponding increase in the relative frequency of industrial accidents. After an interesting analysis of the evidence at hand Dr. Harris states in his general conclusions that:—

"In Germany, Austria, and Great Britain the serious accidents, namely those causing death or permanent disablement, show a tendency to decrease. In Germany and Austria, the accidents which cause disablements from which the workman eventually recovers, show a tendency to increase, there being no information on this point for Great Britain. In Germany there has been an elaborate, persistent campaign for at least a decade for the purpose of reducing the accident risk and in this period the number of accidents of the type which may be called 'minor' has steadily increased. The progress in the movement for reducing the risk of industry, therefore, has resulted in distinctly reducing the risk of death or permanant disablement, but has not yet diminished the risk of temporary disablement."

England's Tuberculosis Recommendations.

The Committee appointed by Lloyd George, Chancellor of the English Exchequer, to consider a constructive program for the prevention of tuberculosis under the new state insurance act, has issued a preliminary report.

The report recommends the establishment of dispensaries for diagnosis, and sanatoria, farm colonies and open air schools for treatment. For this purpose it is recommended that the funds provided by the insurance act be used in addition to a further sum provided by the finance act of 1911. The funds available from the insurance act will amount to $4,490,000 a year and the finance act provided a capital sum of $7,500,000, making a total of almost $12,000,000 for the first year.

The committee suggests tentatively that a dispensary is necessary for every 150,000 to 200,000 people in urban neighborhoods, or a possible total of 300 such establishments in the United Kingdom. In regard to sanatoria the committee believes there should be one bed for every 5,000 of population.

Housing Conditions in Paris.

"The natural advantages of Paris are equalled by few of the capitals of Europe. Situated on the banks of a river which flows rapidly enough to prevent stagnation, the ground rises gradually to the out-skirts. The citizens have not been slow, however, to effect artificial improvements, and especially during the past 50 years, since the time when Baron Haussmann constructed his magnificent boulevards, circuses, crescents, and open spaces. There still appears to be a great deal to be done to improve still further the conditions under which many of the inhabitants are living. The *Times* Paris correspondent recently gave an interesting account of the schemes which the Municipality has in contemplation with this end in view. A loan of £36,000,000 is being devoted to the embellishment of the city, the improvement of roads, the opening of new streets, and the construction of new school and hospital buildings.

There is a proposal to lay out spacious boulevards to run right round the city on the lines of the present inner fortifications and moats, which are now considered to be antiquated, dilapidated, and useless. A sum of £8,000,000 is to be expended in the erection of dwellings to be let at low rentals. Of this amount £2,000,000 may be lent to building societies which undertake to provide cheap working-class dwellings. Half of the buildings to be constructed must be let to families of French nationality in which there are more than three children. The rents of these are to be fixed at £12 per annum for four rooms, and £10 for three rooms, but families with less than three children will have to pay £16 and £13 respectively. Families of at least four children

under 16 years of age will obtain a further reduction from 1 to 3 per cent. according to the number of children. A certain number of these houses are to be built in the central quarters of Paris in order that the tenants may be near to their work."

The Medical Officer, April 20, 1912.

Seamen and Tuberculosis.

"In his annual report, Dr. Herbert Williams, the medical officer of health for the Port of London, draws attention to the degeneracy of seamen on British ships. He says that the conditions under which seamen on vessels live are peculiarly favourable for the dissemination of pulmonary tuberculosis, and it would seem that, until the Legislature takes some more practical interest in the welfare of seamen, it will continue to be the cause of much mortality. Seamen can do little else but degenerate under the present conditions. They are shut up in quarters below deck which are practically in constant use as a sleeping, living, and dining room, and are generally dark, dirty, damp, and encumbered with clothing. In some of the smaller vessels the men have even to provide and keep their food in their quarters."

The Medical Officer, May 25, 1912.

Tuberculosis Death Rate Declines.

The National Association for the Study and Prevention of Tuberculosis has compiled from data abstracted from the Annual Mortality Reports of the Bureau of the Census a table showing how the death rate from tuberculosis declined in the decade 1901 to 1910 in the registration area of the United States. According to this table, the death rate from tuberculosis declined 18.7 per cent. in the 10 years, showing a steady downward trend, while the death rate from all causes declined only 9.7 per cent., the decrease being less steady. As this is the first ten year period for which annual mortality statistics are available for the registration area, these figures are significant. The complete table follows:

DEATH RATES FROM TUBERCULOSIS (ALL FORMS) AND FROM ALL CAUSES OF DEATH IN THE REGISTRATION AREA, UNITED STATES, FOR EACH 100,000 POPULATION, 1901 TO 1910 INCLUSIVE.

(From data abstracted from the Annual Mortality Reports of the Bureau of the Census.)

Year.	T. B. Death Rate.	Death Rate all Causes.
1901	196.9	1656.0
1902	184.7	1594.1
1903	189.0	1611.8
1904	201.6	1663.9
1905	193.6	1616.0
1906	180.2	1567.5
1907	178.5	1597.1
1908	167.6	1478.0
1909	160.8	1440.0
1910	160.3	1495.8
Decrease in death rate,	18.7%	9.7%

Appointments.

Doctor Wilmer R. Batt, State Registrar of Pennsylvania, has been appointed by Doctor J. N. Hurty, president of the A. P. H. A., to serve on the Committee on Vital Statistics of the American Medical Association, and Doctor D. L. Harris, St. Louis, has been appointed delegate to the Conservation Congress to represent the American Public Health Association on the Advisory Board.

An Important Tuberculosis Investigation.

Drs. MacKnight and Coon, two of the State Inspectors of Health of Massachusetts have recently conducted an investigation into what happens to patients released from State Sanatoria and Local Tuberculosis Hospitals (Monthly Bulletin State Board of Health, Mass., March, 1912). The following statements are made by the investigators with regard to their finds of various groups of cases investigated:—

Briefly stated, the investigation discloses the fact that 9 of the 27 patients discharged from a state sanatorium were known to be living, while 10 had died since leaving the institution, and 8 were at large without

any knowledge of the fact by a local health authority. Of the 9 persons known to be living 3 are now inmates of a State sanatorium, while each of the remaining 6 is careless as regards the spread of infection. A striking fact which the investigation disclosed is that each patient returned from the State sanatorium as "an arrested case" was found on physical examination either in an advanced or moderately advanced stage of the disease.

The investigation further disclosed the fact that persons are discharged from State sanatoria to go whither they may. They sometimes return to their original place of residence, or they may seek new domiciles in the same city. They may never return to their original location, but may go to other cities or even other States. In any event it appears that no person or organization is responsible or assumes responsibility for the care and conduct of patients discharged from a State sanatorium.

It is a fact that most of the 27 patients investigated on leaving the sanatoria have been found to be careless in their personal habits, especially as regards the prevention of the spread of disease among well persons. They have thus failed to profit by the instruction received at the State hospitals.

Another fact made clear by the investigation and well illustrated by the experience of one patient is that some of the physicians who recommend sanatorium treatment are not sufficiently expert in making a proper diagnosis.

Still another fact made clear by the investigation is that a considerable proportion of the patients discharged from a State sanatorium as an 'arrested case' relapse immediately or shortly afterwards, into a condition of well-advanced sickness. On returning home the patients are generally left to their own resources.

A second group of 19 cases who had received treatment in a State sanatorium disclosed the following:

1. The absence of a strict supervision of tuberculosis patients who have had hospital treatment in a state sanatorium.

2. The need of local hospital provisions for the care and treatment of a certain proportion of cases.

3. Failure on the part of some physicians to report the disease.

4. Failure of local health authorities in some instances to follow up reported cases and see that the patients and the public are properly cared for.

5. The necessity of more practical cooperation between existing local and State authorities.

The third group of cases investigated were those discharged from the Lawrence Tuberculosis Hospital, 127 in all. The authors give their results as follows:—

"An analysis of the records of the hospital shows that 75 patients, 59 per cent. of all the patients discharged, have died; that the whereabouts or present condition of 17 patients are unknown; that 6 patients have, apparently, recovered; and that one person was decided not to have had tuberculosis.

"Of the remaining 28 cases now actively ill with the disease all but 4 were found living in tenements, and some amidst bad sanitary surroundings. With the exception of 2 instances especial precautions were not taken to prevent the spread of the disease.

"To none of the 28 patients had advice or assistance been given by the local board of health.

"Many of the patients were found out and about each day on the streets, in moving-picture houses and elsewhere, even though they were spitting promiscuously. One patient had returned to school, although having considerable cough and some expectoration and occasional hemorrhage. One patient went to work in a mill. Three of the patients had confirmed habits of intoxication.

"Each of these patients, now a menace to the public health, was at one time, as has been shown, under treatment in a municipal hospital. They have been allowed in many instances to return to crowded tenements and to unsanitary homes, and no successful attempt was made by local authorities to keep track of their whereabouts."

This paper brings up an extremely important point in tuberculosis prevention, and the findings of these investigators are most discouraging, indicating as they do the fail-

ure of the lessons learned in the hospital and sanatoria to be applied on leaving the institutions. Many of the serious considerations of tuberculosis control are indicated.

The Dangers of Picnics.

The Department of Health of St. Paul, Minn., in its April Bulletin issues a special warning against picnics and summer vacations in insanitary places. It is pointed out that many places where picnics are held are maintained in a grossly insanitary condition and that some are a positive menace to the health and life of those who patronize them. The warning to those considering picnics is especially directed against polluted drinking and bathing water, toilet arrangements, and garbage disposal.

Isolation of B. typhosis from Excreta.

Drs. Lumsden and Stimson in Public Health Report for May 24, 1912, contribute a short article on the examination of excreta for typhoid bacilli. They recommend a primary planting of both feces and urine on Endo medium and then fishing typhoid like colonies and inoculating on to Russell's medium (a 2 % agar to which has been added litmus, lactose and glucose). They state that "On Russell's medium inoculated in this way typhoid bacilli leave the surface of the medium blue but change the medium in the butt of the tube to a bright red; colon bacilli redden both the surface and the depths of the medium and cause the formation of gas bubbles throughout the depths of the medium; paratyphoid bacilli leave the surface blue, but produce redness and gas bubbles in the butt of the tube; dysentery bacilli leave the surface blue and change the medium in the butt of the tube to claret color quite readily distinguishable from the brighter and more pronounced redness produced by typhoid bacilli."

If any of the tubes of Russell's medium show a typhoid like growth, the culture is to be tested for agglutination with typhoid agglutinative serum, and "since typhoid bacilli just isolated from excreta may not agglutinate in as high dilutions as will stock cultures, the test for agglutination should be made with several comparatively low dilutions before deciding that it is negative." If positive agglutination takes place, the organisms are plated out to obtain a pure culture and then tested through the various cultural and biochemical tests to establish with certainty its identity.

Bacteria and Flies.

Dr. John C. Torrey contributes an article on Number and Types of Bacteria Carried by City Flies to the March number of the Journal of Infectious Diseases. He reviews briefly the general beliefs concerning the fly as an agent to spread disease and states that the work was undertaken "with the hope of gaining some additional light on the nature of the bacteria conveyed by flies." The flies were trapped in the laboratory, and the laboratory faces the rear of a row of tenements of the poorer grade with an intervening space of 75 feet. Dr. Torrey writes that "it seemed possible that flies might have picked up bacilli of the dysentery type from the soiled diapers of infants sick with infective summer diarrhea, for without doubt such dejecta were occasionally exposed to them. Examinations were made to show the number of organisms on the surface of the flies and also the intestinal bacterial content. The former varied from 470 to 4,400,000 bacteria per fly and the latter from 16,000 to 28,000,000. No evidence was found which would show an increase in the number of fecal bacteria within the intestine of the fly and no distinctive flora is developed as in warm-blooded animals."

Dr. Torrey summarizes his investigation as follows:—

"1. Flies examined up to the latter part of June were free from fecal bacteria and carried a homogeneous flora of coccal forms.

"2. During July and August there occurred periods in which the flies examined carried several millions of bacteria, alternating with periods in which the number of bacteria were reduced to hundreds. The scanty flora probably indicated the advent of swarms of recently hatched flies.

"3. Fecal bacteria of the colon type were first encountered in abundance the early part of July.

"4. The bacteria in the intestines of the flies were 8.6 times as numerous as on the surface of the insects.

"5. On the surface of the flies the colon group bacteria constituted 13.1 per cent. of the total; and within the intestine 37.5 per cent. of the total.

"6. Of the lactose fermenters, isolated and identified, 79.5 per cent. belonged in the colon-aerogenes group and 20.5 per cent. in the acidi lactici group.

"7. Fifteen cultures of streptococci, isolated and identified, were distributed among the equinus, fecalis, and salivarius groups. There were none of the pyogenes type.

"8. The most important isolations were three cultures of B. paratyphosus, Type A.

"9. Bacteria of the paracolon type causing a final intense alkaline reaction in litmus milk and fermenting only certain monosaccharids were frequently encountered during August."

Sterilizing the Croton Water Supply.

Although the quality of New York City's Croton water, supplying the boroughs of Manhattan and the Bronx, has in general been quite good, the city is now preparing to make assurance doubly sure by sterilizing the entire supply with hypochlorite of lime. The more immediate cause of this precaution seems to be the possibility of infection by workmen on the new Catskill aqueduct, which crosses the Croton water shed.

The installation, which is under construction at Dunwoodie where the new and old Croton aqueducts lie close together, is probably the largest of its kind yet attempted and will apply a little over 3 tons of commercial hypochlorite to 380,000,000, gallons of water each day. This is calculated to give 0.5 parts of available chlorine per million of water treated.

The solution of hypochlorite will be made up to a strength of 2 per cent. in solution tanks, and will be agitated with compressed air to secure uniformity. This solution will then be applied directly to the water in the aqueducts by perforated pipes, and mixing will be made thorough by an arrangement of baffle plates. The plant will probably be in operation this fall.

Eng. Record, Vol. 65, No. 22, June 1, 1912.

Purifying Thames Water.

"Purification of the Thames water by the addition of quicklime with subsequent dilution to render it potable is suggested by Dr. A. C. Houston of the Metropolitan Water Board of London, England. Dr. Houston states that 15 lb. of quicklime, costing about 3 cents, added to 7,500 gal. raw water would kill the B. coli, and inferentially but certainly the microbes of epidemic water-borne diseases, such as the typhoid bacillus. The excess of lime would then have to be neutralized with 2,500 gal. or one-third of the volume of adequately stored water to render it potable. In this way 75 per cent. of the water would be sterilized chemically and the remaining 25 per cent. sterilized by storage. Subsequent to this treatment, rapid filtration alone would be required to remove the precipitate of inert carbonate of lime and to bring the water up to a reasonable standard of chemical purity. He states that this system would be more expensive than sand filtration, but would have certain distinct advantages, notably its adaptability, its special suitabliity for flood waters, its capacity for flood waters, its capacity to render an initially foul water absolutely safe in a reasonably short space of time."

Eng. Record, Vol. 65, No. 22, June 1, 1912.

Boric Acid in Sausages.

"At the Blackburn Police-court, on January 26th, Messrs. John Wells & Co. were summoned for selling sausages that were not of the nature, substance, and quality demanded. A pound of sausages was purchased from the defendants on December 22nd, and on analysis were certified to conrain 63 grains of boric acid per pound. Dr. Greenwood, medical officer of health, stated that boric acid was particularly injurious in cases of indigestion, and in some forms of kidney disease would be positively dangerous. On being asked, in cross-examination, whether he knew the Manchester magistrates had dismissed a case relating to sau-

sages that contained 70 grains of boric acid per pound, the witness suggested that those magistrates should have the sausages administered to them. On behalf of the defendants, it was stated that they had been making sausages for over forty years, and for about twenty-six years had used it as a preservative, as they found that otherwise the sausages would not keep. The chairman said the Bench did not think there had been any intention to deceive the public, but they felt compelled to convict, and inflicted a fine of £1 and costs."

Public Health, May, 1912.

The Treatment of Pulmonary Tuberculosis by Tuberculin.

Under the above caption the Lancet of May 11th discusses editorially the present status of tuberculin in relation to the treatment of pulmonary tuberculosis. After evaluating recent contributions to the literature of the subject by Doctors Wilkinson and Latham, the Lancet states its position as follows:—

"Treatment by tuberculin is a useful method of therapeutics, but it is foolish to decry all other procedures, especially the 'sanatorium.' No physician who has had experience with the various methods adopted will support such a view. Tuberculin is a valuable adjunct in the treatment of certain cases of pulmonary tuberculosis, but it must be used in conjunction with other methods if its full advantages are to be obtained. Combined with routine treatment in a sanatorium or other special institution, or at home if the surroundings are satisfactory, tuberculin, if carefully used, will yield valuable results. Tuberculosis cannot be eradicated, by sanatoriums, or by dispensaries, or by tuberculin, or by any single measure. It demands a mobilisation of all forces, medical and social. To advocate one system in contradistinction to all others is to delay progress and to discredit scientific research. The prominent attention that has been drawn recently to the use of tuberculin has been valuable, but substantial advance is more likely to ensue if it is admitted that cases of pulmonary tuberculosis vary so much, even in the early stages, that there is no one method which can generally be adopted."